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**Abstracts of Tuberculosis** ***will be published at intervals as an integral part of the*** **American Review of Tuberculosis.** ***It will receive separate paging and may, if desired, be bound separately at the completion of the volume.***

***The Abstract Editor is Dr. George Mannheimer, 41 West 51st Street, New York City. Prompt transmission to him of reprints or abstracts of papers on tuberculosis, sanatorium or board of health reports, etc., will promote their early publication in this section.***

***Abstracts should be sent typewritten on one side of the page only. They should be as concise and compact as the subject matter of the article warrants. They should be headed with a short title, and followed by the full title of the paper, author's name, journal, date, volume and page.***

**Remineralization in Tuberculous Coxitis.**—Maragliano comments on the need for minerals when a tuberculous coxitis is healing. Besides the usual general measures, he supplies material for new bone directly to the process. The distance from the great trochanter to the bottom of the acetabulum is measured under the roentgen rays, and a corresponding rod of bone and periosteum is cut from the crest of the tibia, about 1 cm. thick. This bar is worked through the neck and head from the trochanter, after a passage has been dug for it, till the end emerges in the acetabulum. The porous condition of the bone renders this easy. It is important to have the periosteum project about 1 cm. beyond the end of the bar of bone. This end is turned down over the bone which prevents the periosteum from being stripped off from the bar as it is worked into place. He has thus operated in four cases, and the results of this slight operation to ensure remineralization of the joint bones have been very favorable.—*La Remineralizzazione Chirurgica Delle Coxiti Tubercolare, D. Maragliano, Rif. Med., April 12, 1919, xxxv, No. 15, 292.*

**Why Tuberculous Persons Without Funds Should Not Leave Home.**—The Denver Antituberculosis Society sends us the following contribution: It is reliably estimated that several hundred tuberculous persons without funds come to Denver every year. Practically all of them have the mistaken idea that climate will cure tuberculosis. Since Colorado has no state, and Denver no municipal tuberculosis sanatorium—but merely a ward at the County Hospital for thirty-five very sick tuberculous residents, the care of such indigent persons is limited to a few free private sanatoria, which are continuously so overtaxed that admittance is a long and difficult matter. These sanatoria comprise the two Jewish, which accept only a small number of Gentiles, a tent colony with a capacity for seventy "down-and-outers," and a small home for a dozen destitute tuberculous women. The tuberculous poor who migrate to Denver, finding no place where they can be cared for, look for light work, in order to maintain themselves and often their dependent families; but the demand for such work is far in excess of the supply. Driven to any work they can get, with neither friends nor care, anxious, homesick, hopeless, they rapidly grow worse, and, usually, soon die. They die for lack of proper rest, food, fresh air, and medical attention, the essentials of treatment, which many of them could have had at home—or here with sufficient funds, for two years' care. Without these essentials climate is of no avail. If it were, Denver would welcome these tragic health seekers instead of urging them, for their own

best chances, to stay at home. Denver also urges that the states throughout the country plan definite programs to retain their indigent tuberculous, giving them effective treatment in state sanatoria or in their own homes. —*Weekly Bull. Dept of Health, City of New York, November, 1919, viii, No. 44.*

**Tuberculosis in New York City.**—Notwithstanding the return of soldiers from the war and of many civilians from employment in war industries in other cities, our tuberculosis registration continues to be markedly low; in fact it is so low as to occasion suspicion that this is due in no small degree to the relaxation of efforts in various anti-tuberculosis activities conducted in previous years by non-departmental as well as departmental agencies. In view of the continued high mortality rate from tuberculosis, one may, with reason, doubt that tuberculosis is actually becoming less prevalent. At all events, we are not justified in assuming this to be so until by careful and intensive effort, we further stimulate the discovery of cases by private physicians and clinics, and also work to secure the report of all cases by private physicians. As evidence of the diminishing number of cases of tuberculosis recorded with the Department of Health, attention is called to the following quarterly report:

*Tuberculosis*

Quarters Ending June 30, 1918 and 1919

| | | MANHATTAN | BRONX | BROOKLYN | QUEENS | RICHMOND | CITY |
|---|---|---|---|---|---|---|---|
| Population | 1918 | 2,731,731 | 622,555 | 2,023,170 | 392,966 | 101,721 | 5,872,143 |
| | 1919 | 2,780,485 | 645,894 | 2,070,539 | 406,236 | 103,640 | 6,006,794 |
| New cases reported | 1918 | 2,631 | 478 | 1,428 | 178 | 42 | 4,757 |
| | 1919 | 2,256 | 463 | 1,025 | 145 | 56 | 3,945 |
| Total cases in register | 1918 | 19,379 | 3,324 | 7,828 | 1,563 | 260 | 32,354 |
| | 1919 | 17,138 | 3,366 | 6,977 | 1,460 | 279 | 29,220 |
| New patients examined at clinic | 1918 | 1,952 | 591 | 1,575 | 212 | 20 | 4,350 |
| | 1919 | 1,868 | 491 | 1,553 | 216 | 19 | 4,147 |
| Total visits of patients to clinic | 1918 | 11,715 | 3,983 | 8,179 | 1,741 | 154 | 25,722 |
| | 1919 | 10,170 | 3,297 | 6,862 | 1,612 | 193 | 22,134 |
| Cases under supervision | 1918 | 229 | 171 | 506 | 7 | 4 | 917 |
| | 1919 | 151 | 161 | 368 | 2 | 5 | 687 |
| Voluntary renovations | 1918 | 1,426 | 193 | 907 | 125 | 40 | 2,691 |
| | 1919 | 450 | 138 | 481 | 72 | 35 | 1,176 |
| Sputum examined | 1918 | 8,226 | 1,770 | 3,641 | 606 | 96 | 14,339 |
| | 1919 | 6,065 | 1,538 | 2,719 | 489 | 106 | 10,917 |
| Sputums positive | 1918 | 1,817 | 333 | 827 | 163 | 23 | 3,163 |
| | 1919 | 1,647 | 282 | 667 | 117 | 26 | 2,739 |
| Deaths, pulmonary tuberculosis | 1918 | 1,145 | 231 | 679 | 151 | 40 | 2,246 |
| | 1919 | 1,012 | 278 | 562 | 115 | 36 | 2,003 |
| Deaths, pulmonary tuberculosis, per 1000 population | 1918 | 1.69 | 1.49 | 1.35 | 1.54 | 1.58 | 1.53 |
| | 1919 | 1.46 | 1.73 | 1.09 | 1.14 | 1.39 | 1.34 |
| Deaths, all forms of tuberculosis | 1918 | 1,318 | 275 | 802 | 183 | 48 | 2,626 |
| | 1919 | 1,183 | 302 | 653 | 134 | 41 | 2,313 |
| Deaths, all forms of tuberculosis, per 1000 population | 1918 | 1.94 | 1.77 | 1.59 | 1.87 | 1.89 | 1.79 |
| | 1919 | 1.71 | 1.88 | 1.27 | 1.32 | 1.59 | 1.55 |

—*Weekly Bull., Dept. of Health, City of N. Y., October 18, 1919, No. 42.*

**Tuberculosis in Health Resorts for the Tuberculous.**—The fear of infection from contact with tuberculous patients is still widely prevalent among the laity. This phthisiophobia has often presented an obstacle to the institution of desired relief measures in the management of the tuberculous. The "fear born of ignorance" is not directed to these unfortunates alone. Even today it is frequently a difficult task to secure a suitable site for any contagious disease hospital in the vicinity of human habitations. The dread with which such an institution is still contemplated cannot be dispelled by exhortations or governmental edicts. The absence of special dangers in the environment of hygienically managed sick persons must be demonstrated in ways that will bring conviction to those capable of independent reasoning. The experience of a community frequented by tuberculous individuals who live with and among other residents, with no attempt at segregation of the sick from the well, ought to contribute convincing data. A survey recently made of the indigenous incidence of tuberculosis at Saranac Lake in the Adirondacks affords a striking illustration. This settlement has grown from small beginnings in the pioneer days of the late Dr. E. L. Trudeau into a health resort of prominence for patients afflicted with tuberculosis, especially of the pulmonary type. About one-fifth of the total population of several thousand persons is made up of individuals who went to live at Saranac Lake for their health. According to the statistics gathered in 1917 by Ames, under a fellowship grant of the Trudeau Foundation, the indigenous morbidity and mortality from tuberculosis were low, only 0.3 per cent of living cases being found among the native born and 0.9 per cent among previously healthy residents. The few facts on record for European health resorts likewise indicate that tuberculosis does not increase among the native population after tuberculous patients reside in a community, despite the assumption that a concentration of infectious foci might increase the occurrence of clinical manifestations of the disease even in the presence of better hygienic surroundings. The health resorts of Colorado are not regarded as a menace to the residents. From the consensus of evidence, Ames ventures the logical conclusion that there is a minimum of danger of infection of healthy adult residents of resorts frequented by tuberculous patients. In harmony with this finding is the attitude of the inhabitants. Fear is absent. Education through observation and experience has dispelled phthisiophobia. The tuberculous person in such enlightened communities is free from the stigma that so often is a barrier to his progress, even after health has been restored.—*Editorial, J. A. M. A., October 25, 1919, xxxiii, No. 17, 1288.*

**Community Machinery for the Discovery of Tuberculosis.**—Up to the present time communities with hospital facilities, clinics, tuberculosis nurses, and some educational service have considered themselves equipped for tuberculosis work; but this equipment does not provide for the discovery of new cases of tuberculosis. This is essentially a medical job and requires medical machinery; it cannot be done by nurses. During the Health Demonstration in Framingham, Mass., "the first medical examination drive" disclosed approximately nine times as much tuberculosis as was found by the nurses, and this is a community where there was an excellent tuberculosis clinic and one of the best tuberculosis nurses in the State at the head of the nursing service. Since the Health Demonstration, Framingham has added to its antituberculosis work several new features, of which those of chief interest relate to measures for the discovery of tuberculosis. Previously adopted routine measures include: (1) reporting of cases by private physicians, the number of cases so reported having been increased since the Health Demonstration; (2) the Tuberculosis Dispensary, which has brought to light a certain number of cases. New routine measures have been established through: (1) medical work in the schools; (2) factory medical work, about half of the industrial workers being under full medical supervision and others under partial supervision; (3) establishment of infant clinics, pre-school work, summer camps for children and other medical examinations reaching an additional substantial portion of the population. Special measures include: (1) medical examination campaigns, or drives to carry on "wholesale" examinations on large sections of the population, instituted during the Health Demonstration. This work gave valuable data on the incidence of tuberculosis, and also aroused public interest, encouraged people to go to their own physicians for regular medical inspection, and created popular sentiment in favor of medical examination work in schools, factories and elsewhere; (2) expert consultation service, occupying the full time of one physician as expert consultant at the Framingham Health Station. His services are offered to all physicians, and the advantages of such a service made known to the general public. The consultations are largely on a free, but partly on a pay basis. This is one of the most important features of the Framingham plan. Its advantages may be briefly summarized as fol-

lows: (1) The presence of an expert consultant, working in coöperation with local physicians, serves in a measure as a post-graduate education offering opportunities similar to clinic, lecture and demonstration procedure. (2) This work tends to improve and standardize routine methods of diagnosis, classification and treatment. (3) It has been the means of increasing the amount of known tuberculosis under observation or treatment. (4) By removing in many cases the burden of diagnosis from local physicians, it encourages the discovery of early cases. (5) It encourages tuberculosis reporting. (6) It tends to improve methods of home treatment and increases the percentage of cases institutionalized, the consultant being equipped to advise regarding the best method of treatment. (7) It supplements the other medical, nursing and dispensary community machinery, and provides the primary discovering machinery essential to the efficiency of all the other measures.—*Community Machinery for the Discovery of Tuberculosis, D. B. Armstrong, Boston M. & S. J., August 28, 1919, clxxxi, No. 9, 255.*

**Plan for Antituberculosis Organization.**—A comprehensive program for fighting tuberculosis should include: Organization, Legislation, General Community Sanitation, Disease Detection, Disease Classification, Treatment, Subsequent Observation, Prevention and Education, Research and Demonstration. Each of these headings is subdivided in detail and forms a definitely arranged plan which may be adopted by a community in the fight against tuberculosis.—*A Community Tuberculosis Program, D. B. Armstrong, Bull. N. T. A., October, 1919, v, No. 13.*

**Framingham Demonstration.**—It has been found useful at Framingham to supplement the accepted N. T. A. classification of tuberculosis. The cases are divided into early, advanced, convalescent, arrested, apparently cured, dead. The "early" group is subdivided into incipient, early, moderately advanced. The last subgroup is frequently bacillary while the former two are not. The group "advanced" is also subdivided into rapid, slow, stationary. The importance of this is evident when the method of treatment is considered. The rapidly progressing case needs a rigid care while the stationary case may even be allowed to work. The group designated "convalescent" is to identify cases clinically uncertain between the active and arrested stages. The group "arrested" is subdivided into early and advanced to denote the prior condition of the patient, and is important for follow-up purposes.—*The Classification of Tuberculosis, D. B. Armstrong, Bull. N. T. A., July, 1919, v, No. 10.*

**The Health Officer and Tuberculosis.**—When a case of tuberculosis comes to the notice of the Health Officer repeated sputum examinations are made to decide whether the case is open or closed. Six consecutive negative results are required within a week or two before a case is designated as closed. Open cases are isolated at home, in a hospital or in a sanatorium; this isolation should be rigidly enforced. The closed case is advised in the manner thought best in the particular case and is closely watched. In the case of children, who seldom become open cases, the parents are advised to have them under proper treatment and away from school, though the latter measure is not compulsory. All the members of a family in which an open case had been discovered are examined, and often also others who came in contact with members of this family. While closed cases are sent to the sanatorium only after the routine formalities are gone through, open cases are immediately admitted. The sanatorium should be so designed that open cases do not mix with closed ones and with each other, at least while they are running a septic temperature.—*The Attitude of the Medical Officer of Health with Respect to Tuberculosis, H. W. Hill, Med. Ins. & Health Conserv., November, 1919, xxix, No. 2, 65.*

**American Commission for Prevention of Tuberculosis in France.**—Following a report by Dr. Biggs on tuberculosis in France, a commission to carry on a campaign of education was organized by the International Health Board, a part of the Rockefeller Foundation, in 1917. Further investigation showed that there were fewer cases of tuberculosis in the French army than had been feared, but a high mortality in the civilian population. The nervous strain of the war and the restrictions in diet tended to increase the incidence of the disease, while the institutions that had been established for treatment were used for military purposes. The chief work of the commission was to institute a campaign of propaganda and education, to offer ideas and plans for a comprehensive antituberculosis organization for the whole of France, and not to give aid to any special group of the population. For demonstration and instruction a system of tuberculosis dispensaries was established in each of two centers, —one in the 19th arondissement of Paris, a typical city district, one in department of Eure-et-Loire, a typical rural district. At

the Paris dispensaries 4689 patients were examined and 1529 found to be tuberculous; at the Eure-et-Loire dispensaries, 2184 were examined, and 673 found tuberculous. Treatment was provided in Red Cross sanatoria and municipal hospitals. Over 100 French nurses were instructed and trained in the treatment of tuberculosis at the Paris dispensaries, and sent out to the Eure-et-Loire demonstration centers and to organize dispensaries in other districts. The Bureau of Education and Propaganda distributed over two million pieces of literature and held public lectures, conferences, and exhibits in 141 cities and towns of ten departments. Dr. Bruns, secretary of the commission, made a large number of preliminary surveys in other departments, and by means of lectures and conferences initiated the organization of permanent departmental committees to carry on the work by establishing tuberculosis dispensaries and demonstration centers. A permanent American-French committee was organized for the study and discussion of important problems in the campaign against tuberculosis.—*Work of the American Commission for the Prevention of Tuberculosis in France, W. C. Klotz, Brit. J. Tuberc., July, 1919, xiii, No. 3, 112.*

**Welsh National Memorial.**—According to the report of the Welsh National Memorial Association presented on July 26, 1919, the work of the Association went on successfully during the war. At the end of July, 1914, the association had 87 hospital beds and 148 sanatorium beds; by 1919, the number of hospital beds was 473, the sanatorium beds, 594. In the year ending March 31, 1914, 8763 patients were examined; in the year ending March 31, 1919, 12,260. During the war more than 50,000 in all were examined; 11,402 had received treatment in hospitals and 6373 in sanatoriums. These numbers include more than 2500 discharged service men examined, and more than 1600 treated in hospitals and sanatoriums. A special section of the report deals with the principles and ideals for the organization of the campaign against tuberculosis.—*The Welsh National Memorial, Editorial, Lancet, September 27, 1919, No. 5013, 592.*

**Primary Pulmonary Tuberculosis in Children.**—The findings of eighty-four necropsies made on children up to 10 years of age are recorded. Sixteen (19.05 per cent) showed tuberculous lesions. The lung focus was found to be most often the size of a pea. Single lung foci were found on eight occasions. Two foci, apparently about the same age, were found in one case, and one case showed more than two foci, of which one, being cavernous, appeared decidedly older than the remainder. In the majority of cases the focus was caseous or fibrocaseous. In one case it was calcareous, in one case liquefying, and in one case there was cavitation. In all cases the lung focus was situated just beneath or involving the pleura. In the cases where only one lung focus was present it was situated in the left lower lobe in three cases, in the right upper lobe in two, in the left upper lobe in two, and in the right middle lobe in one. Tuberculosis of the mediastinal glands, other than acute miliary tuberculosis, was found in twelve cases. Tuberculous lesions of the intestines were found in four cases. Tuberculous mesenteric glands were present in seven cases. Bronchopneumonic changes in the lung tissue, due apparently to the direct spread from a tuberculous lesion, were found in three cases. Miliary tuberculosis was found in five cases where a lung focus was present, and in two cases where no lung focus could be found. From these findings it would, therefore, appear highly probable that tuberculosis of the mediastinal glands is secondary to a focus in the lungs, and, further, that the focus in the lung is primary and not secondary to a focus elsewhere.—*Primary Pulmonary Tuberculosis in Children, R. G. Canti, Quart. J. of M., October 1919, xiii, No. 49, 71.*

**Tuberculin Skin Tests in Schoolchildren.**—The author gives a number of large tables showing the response to the Pirquet test in 7969 schoolchildren. It was positive in 37.8 per cent of the 6978 in the public schools and in 33 per cent of the 991 in private schools.—*Tuberculin Skin Tests of Schoolchildren at Tronhjem, A. Arnfinsen, Norsk Mag. f. Laege vidensk., May 1919, lxxx, No. 5, 508.*

**Tuberculosis and Accredited Herd Plan.**—That tuberculosis can be eradicated is not a theory, but a fact. Demonstrations have been carried on in the District of Columbia, Virginia, and other States. There is a compulsory law in the District passed by Congress. In ten years the percentage of reactors has been reduced in all the herds from eighteen to a fraction of 1 per cent. Statistics show in New York State that in regularly tested herds the number of reactors has been reduced. It is seldom that a reactor is found in localities where milk ordinances are enforced. Compulsory physical examination of herds has also reduced the clinical cases.—*Tuberculosis and Accredited Herd Plan, L. B. Leonard, Cornell Veterinarian, July 1919, ix, No. 3, 163.*

**The Intradermal Test in Cattle.**—The chief advantages of the intracutaneous test over the subcutaneous test are the rapidity with which the cattle of a county or section of country can be tested; its accuracy, about 98 per cent of reactors having been shown to have lesions of the disease; the smaller amount of tuberculin used, the rapidity of the work and the convenience of the operator making the test much less expensive. With the subcutaneous test many outside factors may cause sufficient variation in the animal's temperature to render the test of little value. The intracutaneous test is not affected by these influences. In case of doubt after using the intracutaneous test the subcutaneous can still be resorted to; but after employing the latter the former is of little value. The imperative need of eradicating tuberculosis in swine makes this test desirable of employment in these animals, since the subcutaneous test is impracticable owing to difficulty of restraint and great variations in temperatures in hogs. The site of injection in swine is the skin on the back of the ear near the head.—*The Intradermal Tuberculin Test, C. Ackley, Am. J. Vet. Med., December, 1919, xiv, No. 12, 558.*

**Tuberculin Re-test of Cattle.**—The observations here recorded appear to support Gilliland's theory that if animals that had given a suspicious reaction were to receive five to ten days later a much larger dose they would give a strong reaction if tuberculous, and a negative result if nontuberculous. —*Subcutaneous Tuberculin Re-test of Cattle, D. H. Jones, J. Am. Vet. M. Ass., July, 1919, v, No. 4, 444.*

**Generalized Tuberculosis of the Horse.**—The animal was a gelding, eight years old. The autopsy report upon this animal shows that there was a fibrinous pleurisy; lymph glands were hemorrhagically swollen; otherwise the spleen and the lungs were the only organs affected, the latter showing evenly distributed lesions throughout their substance. From inoculation experiments on guinea pigs and rabbits, it appears that the tubercle bacillus in this case was of the bovine type. The source of the infection of this horse is not known, but inasmuch as this animal was stabled in a basement barn with cattle, it is quite probable that there has been a bovine spreader of the disease in the stable at some time, leaving the stable or feed contaminated with tubercle bacilli of the bovine type.—*Generalized Tuberculosis of the Horse, M. F. Barnes, J. Am. Vet. M. Ass., September 1919, v, No. 6, 672.*

**Some Statistics of Tuberculosis.**—Ménard deduces from his prolonged study of 225 tuberculous soldiers that the onset of tuberculosis may present a wide variety of types. The first sign that anything is wrong may be an *embarras gastrique*, neuralgic or rheumatic pains, functional heart disturbance, colds, bronchitis, febrile painful lassitude, etc. The remarkable fact is that having begun insidiously with symptoms of a certain order, it persists in exhibiting this same set of symptoms all through the other symptoms which may develop *en route*. There is then a long latent interval—six months, twenty months, thirty-eight months —after the appearance of the first symptoms before the disease manifests itself. Then it throws off its mask and develops openly. What are the reasons for this sudden transformation from the insidious form to this open manifestation? He suggests that this may represent the true problem of pulmonary tuberculosis.—*Statistique de tuberculose, P. J. Ménard, Ann. d. Med., August 1919, vi, No. 3, 223.*

**Physical Reconstruction.**—Physical reconstruction of soldiers disabled by pulmonary disease is a new policy originating with the present war. At first the plan had but few advocates, but modern medicine must take account of functional as well as physical restoration in the convalescent patient and establish it as nearly as possible. In the treatment of the tuberculous patient, the objections advanced to the above policy are sound in the sense of the application of the measure embraced under physical reconstruction during the active and febrile stage of the disease. On the other hand, when indicated, physical and mental rest, even to the most absolute degree practicable, is as much a factor in physical and mental rehabilitation as physiotherapy, curative work or play when rationally called for. Tuberculosis, as a rule, is a focal infection. The primary focus is usually started in childhood. Later in life the pathogenic lesion takes on an added virulence, or the tissues are less resistant, and the course of the disease depends on these factors. Unfortunately, however, the virulence in some cases is too strong to be met by the ordinary measures of rest, fresh air, feeding, etc. Mental unrest and discontent may appear even if the physical condition is improved. Rationally, we cannot prolong absolute rest beyond the active or febrile stage, and the dosage of mental and physical exercise next prescribed must be under watchful medical supervision. If the progress is favorable, bed-rest periods are shortened and the ambulatory stage with

such physiotherapy as hydrotherapy and massage and occupational therapy modified in kind and dosage to meet the need of the individual patient is taken up. Manual occupational therapy should be used as early as mental and physical activity admits. Billings goes into some detail on this subject. When the tuberculous soldier has reached the stage of arrest or inactivity of the disease he may be discharged, but the measures adopted in modified form in his earlier treatment may still be needed to a certain extent to prevent relapses. The results already obtained have been so beneficial that it is hoped that they can be continued in civil life and tried out under the direction of civil physicians. The almost universal testimony of the commanding officers of hospitals and the educational personnel agrees as to the great value of the work already done.—*Physical Reconstruction Applied in the Treatment of Pulmonary Tuberculosis, F. Billings, J. Am. M. Ass., October 4, 1919, lxxiii, No. 14, 1033.*

**Rehabilitation of the Tuberculous Soldier.**—There have been rejected for tuberculosis by the local draft boards, about 62,000; 23,000 more, by the camp surgeons; about 5000 have been discharged directly from the army and almost 2500 more from the army sanatoria; about 6000 tuberculous soldiers are now under treatment in the army sanatoria in this country and perhaps a few hundred overseas. The importance of the problem of tuberculosis in the army was recognized early in the war; boards of examiners were organized for special chest examinations for the purpose of discovering all cases of the disease and eliminating those unfit for service. Up to the early part of 1918 a great majority of the tuberculosis cases were discharged immediately from the army, but when the new special hospitals were ready it became the policy of the War Department to hold all soldiers said to be tuberculous until fit to return to duty, or until it was evident that no more benefit could be derived from further treatment. Because it was found that the men in the hospitals were not so amenable to discipline as in the camps, and that there was much restlessness and dissatisfaction among the patients, reconstruction departments were organized. The object of these departments was to carry out all medical therapeutic exercises, to keep the patients contented and as busy as their physical condition permitted, and to return them to civil life better fitted to compete with modern conditions. The work was started by the use of therapeutic walks arranged in a series of five, varying in length from two-thirds of a mile to three miles. Men, who were in proper condition after a period of hospital rest, were assigned to the first series, and promoted as their condition warranted through the entire series. Patients were dropped automatically if the temperature rose to 99 or above or if there was loss of weight. Later a carpenter shop, an auto school and a farm were established, and men were graduated from the therapeutic walks into these departments. Class work was organized in schedules that did not interfere with physical reconstruction work, and also for a few who were able to do light mental work, but not physical. A weekly newspaper was established, and picture shows given nearly every evening to patients in the wards. Instruction for patients confined to bed was provided in academic work, drawing and various forms of handicraft. The Otisville Hospital No. 8 reported that 75 per cent of all patients were engaged in some part of the work, and that for many months no person had been obliged to quit any of the outside work on account of increased tuberculous activity. One month's report of the New Haven Hospital No. 16 showed 90 per cent of the patients engaged in some part of the work. When a tuberculous soldier is discharged from the army, he is entitled to compensation, based on his reduced earning capacity. Advanced cases may be cared for at home or in local sanatoria. Those with active disease, but with good hope of recovery may be recommended by the War Risk Insurance Board to local sanatoria or to Public Service hospitals. When the disease is arrested, the soldier is entitled to the services of the Federal Board of Vocational Education to aid him in obtaining work in his former occupation; or, if this is entirely unsuitable, to give him retraining in some new line of work. Education is still necessary to impress upon the soldier and his family that it is not necessary for him to change his residence; that he is not permanently unable to work; and that he should not try to change his occupation unless the work or its necessary environments are positively harmful.—*The Rehabilitation of the Tuberculous Soldier, C. E. Perry, Boston M. & S. J., August 28, 1919, clxxxi, No. 9, 260.*

**Rehabilitation of the Tuberculous Soldier.**—When a man examined in the draft or a soldier found to have tuberculosis is sent home, the state department of health of his state is notified, this department notifying its district health officer, who in turn requests the local board of health, the local tuberculosis department, or other suitable local agency to look up the patient and see

that he receives proper attention. In Massachusetts, 2020 such men have been reported to the state board of health; only 25 of these have been sent to the four state sanatoria, and 30 more are in other hospitals. A study of 1512 of the men discharged shows that 1060 are in their home locality, 60 have left the State, 72 are dead, 156 nontuberculous, 96 have left their home locality, the fate of 68 is unknown. Of those in their home locality, 356 are under medical supervision, 573 have no medical supervision, 131 unknown; 271 are in good condition, 615 in poor condition, 174 condition not stated; 410 are working, 246 not working, 404 not stated. These figures indicate that there is need for improvement on the part of the local health organizations. Patients must be examined more often, and educated in regard to the communicability of the disease, and its curability if treatment is begun early enough. Patients without independent means of support should not be advised to go West to live; they can be taken care of in their home locality. The occupational therapy described by Perry is of the greatest importance in the work of rehabilitation after the patient leaves the sanatorium, and should be inaugurated in all institutions wherever possible, both for civilian and soldier patients.—*The Rehabilitation of the Tuberculous Soldier, S. H. Stone, Boston M. & S. J., August 28, 1919, clxxxi, No. 9, 265.*

**Tuberculosis Problem After the War.**—While tuberculosis as a result of the world war has not become as serious with us as with the European nations, a good deal remains to be done to further reduce the death rate and misery following in the wake of this disease and to enable us to be of help to the less fortunate and less prepared countries of Europe. Birth control for a number of years has been urged by some tuberculosis experts in England but in spite of this sound reasoning women will continue to bear children and many tuberculous women will still become mothers. While some of these tuberculous mothers may not survive, some of the children may, and it is the duty of the physician to endeavor to save these children together with those who have already contracted tuberculosis. Maternity sanatoria must be created. Tuberculosis dispensaries to act as clearing houses for all kinds of tuberculosis afflictions, and attached to them a corps of visiting nurses; preventoria, children's sanatoria, favorably situated sanatoria for the early cases, hospital sanatoria near the large centers of population for the more advanced cases; special institutions for post-sanatorium treatment, special sanitary workshops for training of invalids and expatients; colonies for those able and willing to pursue open-air occupations; and, lastly, open-air schools for tuberculous children and teachers constitute the chain of institutions which an enlightened community must provide in order to cope effectually with the tuberculosis problem. Marriages of tuberculous partners should be prevented. To this must be added the sanitary housing of the masses, industrial hygiene, and child-labor prevention. The duty devolves upon this nation to help and to enlighten the nations of Europe, which have faced starvation and poverty for five years, and to assist them to become happy and prosperous once more.—*The Tuberculosis Problem After the World War, S. A. Knopf, Med. Rec., July 26, 1919, xcvi, No. 4, 135.*

**Tuberculosis in the Canadian Army.**—The incidence of tuberculosis under conditions of army life did not prove as great as was anticipated; and, whereas before the war chief emphasis was laid on the frequency with which cases of tuberculosis were wrongly diagnosed as various other diseases, the experience gained during the war showed the need of emphasis in the other direction, the frequency with which other diseases are wrongly diagnosed as tuberculosis. The pre-war idea, that all that was required to properly handle the tuberculosis problem was unlimited authority backed by unlimited financial resources, was not supported by the results in the army, where these requisites were fully met. A primary essential for coordinating all antituberculosis measures and of reaping from them the greatest possible benefit is education of the general public with regard to the essential facts of the disease, the means necessary for its prevention and the principles of its successful treatment. Of 900 cases under observation, 28 per cent were classified on admission as incipient; 42 per cent moderately advanced; and 30 per cent far advanced. With regard to prognosis they were classed on admission as follows: 54 per cent favorable; 32 per cent less favorable; and 13 per cent unfavorable or hopeless.—*The Tuberculosis Problem under After-War Conditions with Reference to Canada, W. M. Hart, J. of State Med., November, 1919, xxvii, No. 11, 336.*

**Army Tuberculosis Problem in Massachusetts.**—According to the latest figures there were 1604 Massachusetts men rejected at the physical examination under the draft law or discharged from the army camps, on account of tuberculosis. An investigation as to the status of these men, covering all the cities and eleven of the largest towns,

(over 90 per cent of the total population) shows that out of 1566 men rejected by local draft boards, there are 548 concerning whom local authorities can give no information. One hundred and ten have died; of the remaining 622, whose status was known, 500, over 80 per cent, are working and in apparently good condition; 431 of these are under supervision; 28 are working and in poor condition; 43 are at various sanatoriums. Only 42 men were found who were discharged from the service on account of tuberculosis; 29 of these are under supervision, and 11 are in state sanatoriums. The tuberculosis problem in war time is not essentially different from that of peace. The wholesale examination of men under the draft law has brought to light many new cases of tuberculosis, latent or active, as any well-conducted survey would do. The men discharged from the army have been well taken care of in army sanatoriums or by the War Risk Insurance Bureau with the assistance of the Red Cross. Experience with the cases brought to light during the war has, however, emphasized certain phases of the tuberculosis problem. For instance, it has shown that local authorities do not have sufficient knowledge of the sanatorium and hospital facilities available for tuberculous patients, nor how to make use of them. The state should emphasize these facts in a bulletin published at least once a year. The figures quoted show that it is too easy for a man to escape all health supervision after he has been classified as tuberculous or as suspect. Local boards should make an annual survey of their communities, and give adequate accounting of the status of every case of tuberculosis. Another important point is to determine definitely how many of the cases classified as tuberculous or as suspect in the draft and in the Army have the disease in a clinical sense. The standards of diagnosis are, and should be, stricter for the Army than in civilian life; but the State, in studying these cases, and in future tuberculosis work, should formulate standards clearly, as to what constitutes active pulmonary tuberculosis from the state and board of health point of view.—*Army Tuberculosis Problem as Seen in Massachusetts, J. B. Hawes 2nd, Boston M. & S. J., October 23, 1919, cxxxi, No. 17, 499.*

**Medical Notes on Pulmonary Tuberculosis.**—Certain physiological differences between the two sides of the chest are frequent sources of error in the diagnosis of phthisis. The expansion and percussion resonance are relatively deficient over the upper lobe of the right lung, and the breath-sounds in the same situation may be bronchial in quality; this last sign particularly often leads to error. In well-established phthisis, the disease is more often bilateral than the physical signs indicate; the lesions also have probably been present longer than the history indicates. Skiagrams in cases of phthisis must always be interpreted in conjunction with the clinical features. When examination of the chest shows bronchial catarrh, any or all of the following signs indicate pulmonary tuberculosis: (1) signs largely or entirely unilateral; (2) signs more marked at the apex than at the base; (3) râles with the consonating quality; (4) constitutional symptoms disproportionate to the amount of catarrh. The final decision is based on the findings of the tubercle bacilli in the sputum. It is not common to find the physical signs of cavity, e.g., hyperresonant percussion note and cavernous breathing. Cavity is more frequently diagnosed by the knowledge that the disease is advanced and the sputum purulent and abundant. Tuberculosis of the lung anatomically shows three main types: (1) chronic caseating bronchopneumonia—the ordinary type; (2) acute caseous pneumonia; (3) acute miliary tuberculosis. Hemoptysis in an apparently healthy young man should be regarded as evidence of phthisis, and treatment instituted at once. Such early treatment usually results in a cure, in which case the patient may regard the diagnosis as wrong and the treatment as unnecessary. But if the hemoptysis is disregarded the disease is likely to advance, and the physician accused of neglect. Hemoptysis occurs at three different stages in phthisis: (1) early in the disease when the amount of blood is small, unaccompanied by sputum, it comes from the congested bronchi near the tuberculous focus; (2) during the course of a well-established case, when the hemorrhage is accompanied by cough, and often a slight fever, the blood comes from an ulcerated vessel in the wall of a cavity; (3) in an advanced case as a late event, hemorrhage large in amount, and often fatal, blood comes from a ruptured pulmonary aneurism lying in a cavity. The blood is not likely to contain tubercle bacilli, and should not be examined. The sputum should always be examined for the bacilli, no matter how "classical" the symptoms. In diabetes, cirrhosis of the liver, and leukaemia, the resistance to infection by the tubercle bacillus is so low that phthisis may be present in a latent fashion for some time without discovery. There is a decided family tendency to phthisis, as well as to particular types of phthisis; in one family hemoptysis may be common, in another fibrosis, etc. Although certain general principles of treatment are

well established, these general principles must be carefully adjusted to each individual case; not only the type of the disease but the patient's temperament must be considered. The intelligent coöperation of the patient is one of the essentials of success, and this should be fully explained at the beginning of the treatment.—*Medical Notes on Pulmonary Tuberculosis, T. Horder, Practitioner, September, 1919, ciii, No. 3, 176.*

**Diagnosis of Early Pulmonary Tuberculosis.**—Early tuberculosis is defined as that state in which there is an active disease in the lung but the constitutional condition has not become so much impaired that the patient may not recover. Tuberculin tests and the roentgen ray examination show that nearly every adult has been infected with tuberculosis but they do not indicate decisively whether the process is active or not. The general symptomatology is of much importance. Loss of weight, fatigue on comparatively slight exertion, increase in heart rate, low blood pressure, recurring fever, no matter how slight, secondary anemia, disturbed digestion, and cough indicate an active pulmonary tuberculosis. The cough may be slight or severe, but is persistent, with little expectoration, or with expectoration which is watery, mucoid, mucopurulent or hemorrhagic. In some cases there may be a sudden hemorrhage from the lung with only slight previous cough. The presence of tubercle bacilli and of elastic tissue in the sputum clinches the diagnosis. A positive tuberculin reaction indicates that the individual has been infected with tuberculosis, but it does not distinguish between an old long-healed lesion and an active one. Under the roentgen ray, the difference between active and healed lesions is very slight, showing a slight fuzziness of outline in the former, and a sharp outline of calcification in the latter. Percussion or palpation gives valuable information in regard to the changes in the lung, but does not indicate the duration or activity of the lesion. Auscultation gives more definite information, not so much from the respiratory sounds as from the râles. A shower of at least three fine moist râles on inspiration indicates a deposit of tubercle. If the râles are viscid to the ear, rather than watery or abundant, the process is more acute; if the tubercle begins to undergo caseous degeneration, small moist râles are present subcrepitant with inspiration and expiration, and crepitant only at the end of inspiration. Any pneumonia with fever persisting past the usual time for that type and not continuing to resolve makes imperative a careful examination for the presence of a tuberculous lesion.—*The Symptomatology and Diagnosis of Early Pulmonary Tuberculosis, T. A. McGoldrick, Long Island M. J., June 1919, xiii, No. 6, 175.*

**Cracked Pot Sound.**—Various methods of accounting for the cracked pot tympany are enumerated by Walsh, as well as the conditions in which it may occur. It is commonly thought that the larger a cavity in the lung and the nearer to the anterior wall, the more likelihood of its production. Yet we often see cavities of the largest size immediately underlying the surface not producing it. Large cavities apparently connecting freely with large bronchi without the sound having been produced are often found at necropsies. It is ordinarily said that the pathologic conditions required are a large cavity communicating freely with the bronchus and relaxed lung tissue. Walsh reports briefly a case which showed the cracked pot sound in the first interspace near the sternum on the left with dulness to the fourth interspace, December 1, 1918. December 5, it showed ordinary tympany in the first interspace and cracked pot sound in the third interspace 1½ inches from the sternum. A diagnosis of two cavities was made. The roentgen ray, however, showed four cavities, two superimposed on two others. The possibility of the double cavity having some influence on production of cracked pot sound was suggested, and further cases were sought —only one was found. December 30, the first patient died. The necropsy disclosed not four, but three cavities, situated so that the first underlaid the second, and the second the third. The first extended from the apex to the second rib, the second from the first to the third rib, the third from the second interspace to the fourth rib. In other words, though only three cavities were present, they were so placed that in the two situations in which cracked pot sound occurred, there was a part of a cavity superimposed on another. On the strength of this finding, the conclusion was reached that the superimposing of cavities may, at least, aid in the production of cracked pot sound, and investigations were made by artificially introducing cavities into the removed lungs of animals. Percussion of two inflated bladders tied together so as to prevent the escape of air and placed one over the other gave tympany, but not cracked pot sound, and, therefore, the admission of air is necessary, and the mere rattling of cavities on each other is not sufficient to give the sound. An open trachea was percussed both within and without the lung and found to produce it, but not so typically

as occasionally heard. Two open tracheas, however, superimposed produced it exquisitely. These facts explain its occurrence in pneumonia and in crying children better than the usual one. It was never heard over a pneumothorax, though sought for in more than twenty cases. Stanton reports sixty-one cases without cracked pot sound. With the idea of superimposed cavities in mind we would expect it only over a small pneumothorax communicating freely with the lung with a large cavity behind it.—*Superimposed Cavities the Possible Cause of Cracked Pot Sound, J. Walsh, J. Am. M. Ass., November 29, 1919, lxxiii, No. 22, 1656.*

**X-Ray Diagnosis of Cavities.**—Saye, in a study of tuberculous cavities of the lung, divides them roentgenographically into the following groups: (1) The classical cavity, as described by Bouchard. (2) The giant lobar cavity, of frequent occurrence, mostly on the left side, and embracing an entire lobe. (2) Cavities in process of formation, characterized either by a continuous ring in a densely infiltrated zone or by a dark shadow fairly well circumscribed by a ring, and having within a group of small white or gray zones resembling the inside of a loaf of bread, or presenting a "honeycomb" appearance. (4) Abnormal cavity images, characterized by an irregular or sometimes broken border, mostly found in slightly infiltrated areas. (5) False cavity images, described by Schut and others as annular shadows within healthy lung tissue and with no fluid level. The presence of a fluid level is pathognomonic of cavity. DeCerenville has stated that unless the cavity attains the size of a walnut, unless it contains more air than liquid, or has smooth walls, or is surrounded by dense tissue, or is near the surface, or opens into a bronchus, it may escape detection by physical examination. These errors can be checked up and corrected by the X-ray, which in most cases portrays the size, location and character of the cavity.—*Examên Radiologico de las Cavernas Tuberculosas del Pulmon, L. Saye, Arch. Espan. d. Tisiologia, January 1919, i, No. 1, 105.*

**Diurnal Variations of Body-Weight in Tuberculous Patients.**—The observations were made on patients attending Stepney Green Tuberculosis Dispensary, Glasgow. Patients were weighed in the afternoon between 2 and 4 and again the next morning between 10 and 12, being instructed to wear exactly the same clothing at each examination. In the majority of cases there was a decrease in the morning weight as compared with that of the previous afternoon, varying from ½ pound to as much as 4 pounds. There were no changes in sleep or diet that could account for the variation. Out of a total of 962 recorded weights, 146 showed no variation, 205 showed an increase, and 611 showed a decrease. The average increase was 0.77 pound, the average decrease 1.03 pounds. Taking only positive cases, there were 55 that showed an increase, averaging 0.6 pound, while 150 suspect cases showed an increase, averaging 0.3 pounds. Of the positive cases 177 showed a decrease averaging 1.6 pound, as against 434 suspect cases averaging 0.8 pound. A table arranged according to ages shows the decrease to be greatest for the ages of twenty to twenty-four years. —*Diurnal Variation of Body-Weight in Tuberculous Patients, J. McM. Scott, Lancet, October 11, 1919, No. 5015, 639.*

**Hemoptysis.**—While the layman very generally identifies hemoptysis with tuberculosis of the lungs, the overwhelming majority of tuberculous patients do not show this symptom. Among 70 patients, 2 or 3 had occasional slight hemoptysis, and only 4 or 5 had bacilli in the sputum. Hemoptysis is not always of tuberculous origin; blood coming from the mouth may be from the fauces, posterior nares, decayed teeth, ulcers of the larynx, the stomach, or even the small intestines. Even if from the lungs, it does not necessarily indicate tuberculosis; it may be caused by severe cough or other strain, or may be due to pulmonary congestion from initial lesions, pneumonia in the initial stage, emphysema or asthma with chronic bronchitis, bronchiectasis, etc. Hemoptysis of tuberculous origin is of two types—bloody sputum, found in early cases especially, and profuse hemorrhage or pure blood, generally in later cases. The prognosis is favorable if the bleeding comes from a congested area; if from the rupture of an aneurism it usually proves fatal. These patients should be kept perfectly quiet; food should be given in small quantities, and drink restricted. Small pieces of ice may be held in the mouth, and an ice-bag applied to the chest. Morphin may be given, especially to control cough. In limited hemorrhage this treatment is usually sufficient. In profuse hemorrhage from a ruptured aneurysm treatment is usually unavailing; trying the limbs may serve to check the bleeding, and allow a thrombus to form.—*Hemoptysis, H. Rabinowitch, N. York M. J., September 6, 1919, cx, No. 10, 416.*

**High Temperature in Tuberculosis.**—Following an attack of measles and whooping cough, Johnson's patient, then 10 years of age, developed pulmonary tuberculosis. She was treated in a camp and was finally

discharged with the disease arrested. Three years later her temperature ran an irregular course for which no explanation could be given. She had no cough or physical signs of activity in her chest. The temperature began to reach 109° and 110°F., going up quickly though never remaining up for more than one or three hours. She did not complain much during these periods, except of headache. The sputum and urine were negative, also the blood, except for moderate leukocytosis. A roentgenogram of the chest showed considerable involvement of the right apex with a small cavity. A number of miliary tubercles were found on the left choroid (examination two years later failed to find any evidence of these). A diagnosis of acute miliary tuberculosis was made on the eye findings. At this time she was suffering with toothache, and an examination disclosed an abscess at the root of one of her teeth. The trouble was corrected, following which her temperature promptly dropped to normal.—*Case of Tuberculosis with Very High Temperature, G. C. Johnson, Ind. State M. Ass. J., October 15, 1919, xii No. 10, 262.*

**Relations Between Luetin and Tuberculin Skin Reactions.**—Blechmann has been comparing the responses to the luetin and the Pirquet skin tests in eighty children. He obtained a positive luetin reaction in from 30 to 35 per cent. of the children with inherited syphilis, but he also obtained a positive reaction in 40 per cent. of the children free from inherited syphilis. This suggests that the luetin reaction is not specific. His study of the subject seems to indicate that the luetin reaction is quite independent of that of tuberculin, and is rarely so well defined as the Pirquet reaction.—*La prétendue liaison allergique des cutiréactions à la luétine et à la tuberculine, G. Blechmann, Ann. d. Méd., August, 1919, vi, No. 3, 200.*

**New Bacteriology of Tuberculosis.**—According to what has been called the new bacteriology of tuberculosis of Ravetllat, three different forms of organisms are capable of producing tuberculosis. These have been designated A, B, and C. C is the tubercle bacillus discovered by Koch. Bacteriemia is not due to the bacillus of Koch but to the tuberculogenous bacterium A of Ravetllat.—*Transformacion in vitro del bacilo de Koch en bacteria tuberculogena, A. J. Ravetllat & R. Pla y Armengol. Tratamiento de la septicemia tuberculosa, R. Pla y Armengol. Septicemia tuberculosa. Tratamiento, A. Presta, Revista Hig. y Sanodad Pecuarias, Madrid, September, 1919, ix, No. 9, 547, 549, 560.*

**Sedimentation of Tubercle Bacilli.**—The following method was used in a large military chest hospital, and over 20 samples of sputum examined a day with its use. Five cubic centimeters of sputum are mixed with twice their volume of

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| Sodium carbonate (cryst.) | 1 |
| Acid carbolic (cryst.) | 1 |
| Water | 100 |

in a centrifuge tube. The tube is covered, shaken for a few minutes, then incubated for twelve to twenty-four hours. At the end of that time, the tubes are centrifugalized for about fifteen minutes, the supernatant fluid poured off, and films made from 2 or 4 loopfuls of the deposit, stained in the usual way. The chief advantages of this method are: (1) its rapidity; (2) the sputa when taken out of the incubator are sterile; (3) the films resemble the direct smears in the relative proportion of other organisms present and in the presence of mononuclear and polymorphonuclear cells but the mucus is not stained; (4) in almost every case as many, or more, tubercle bacilli are found as with other less simple methods.—*Sedimentation of Tubercle Bacilli in Sputum, J. G. Greenfield & J. Anderson, Lancet, September 6, 1919, No. 5010, 423.*

**Biologic Test for Active Tuberculosis.**—Wildbolz made investigations during the last year and a half on more than 200 persons and demonstrated that when there is an active process of tuberculosis the urine contains an antigen which injected by the Mantoux intracutaneous technic induces infiltration and redness. This does not occur with urine from healthy persons or in urine from persons with healed tuberculous processes. It never occurs unless the person gives a positive response to injection of 1:10,000 tuberculin, but it seems to occur whether the urine is from the person being tested or not, so long as he has an active tuberculous process anywhere in the body, in glands, peritoneum, lung, bones or elsewhere. Wildbolz evaporates morning urine to 1:10, passes once or twice through a paper filter impregnated with 2 per cent phenol, and then makes three sets of two injections on the arm, the two upper with 1:1,000 tuberculin; 3 or 4 cm. below this, two with 1:10,000 tuberculin, and, the same distance below, two with a minute amount of the evaporated urine. The response with an active tuberculous process is the same with the urine as with the diluted tuberculin, but the tuberculin response persists unmodified after the process has healed, while the urine response fades out completely. A similar response was never obtained in the

nontuberculous, not even in syphilis, influenza, etc., with the single exception that urine containing large amounts of staphylococci induced a reaction, so that the findings are not pathognomonic in certain cases of nephritis. With this exception, this biologic reaction may be depended on to reveal the tuberculous or nontuberculous nature of lesions, and will also disclose when they are healed. If the urine reaction persists after the clinical healing of the known process we can be confident that there is some other active process elsewhere. The specific nature of the urine reaction is demonstrated still more conclusively by the fact that, after subsidence of the urine reaction, if an injection of 1:1,000 tuberculin is made nearby, the apparently extinct urine reaction flares up anew, the infiltration and redness becoming distinct again. This does not always occur, but it is frequent enough to testify to the specific nature of the urine reaction. He cites three cases of different types to show the reliability of the findings with this urine test. One, a boy of 13, had for over a year what seemed to be a tuberculous process in the ankle region, rebellious to all treatment. The roentgen findings were negative, the process being apparently in the soft parts. The urine test was negative, and the operation finally revealed a wood splinter in the depths of the fistula. In another case the positive urine reaction was not heeded as the diagnosis otherwise was so obscure, but necropsy revealed the grave tuberculous process in the kidney. In another, the course confirmed the urine test, namely, that the case was one of incipient pulmonary tuberculosis instead of congestive hemorrhages from uncompensated heart disease. By comparing the urine response with the response to the tuberculin test, we can obtain better insight than ever before on whether treatment must be kept up or the patient can be regarded as clinically cured. He repeatedly obtained a negative urine reaction in women nephrectomized a year or a year and a half before on account of isolated tuberculous processes in that kidney. He has never yet noted this rapid subsidence of the urine reaction in men after nephrectomy for this cause, and he assumes this to prove that there is still some lingering tuberculous process, possibly in the prostate or seminal vesicles. If repeated urine tests fail to give a positive response, year after year, we may accept this as evidence that the tuberculosis has been radically cured. He warns that patients being treated with tuberculin may give misleading findings as the tuberculin passing into the urine might induce the reaction. Wildbolz is now engaged in research on intracutaneous injection of other body fluids, the serum, pleural and joint effusions and cerebrospinal fluid, and with conjunctival reaction with the milk of tuberculous cows.—*Der biologische Nachweis aktiver Tuberkuloseherde des menschlichen Körpers durch die intrakutane Eigenharnreaktion, H. Wildbolz, Corr. Bl. f. Schweiz. Aerzte, May 31, 1919, xlix, No. 22, 793.*

**Sputum Albumin Reaction in the Diagnosis of Tuberculosis.**—Salomon calls attention to the marked diagnostic value of the sputum albumin test recommended by Roger and Lévy-Valensi in 1911. The sputum is collected freshly in a dry receptacle, an equal volume of distilled or tap water added, the fluid mixed with a glass rod, mucus coagulated by addition of acetic acid, the resulting fluid filtered through paper, and the filtrate tested for albumin by heat or the addition of potassium ferrocyanide solution. The author modifies the original method by mixing the fresh sputum with saturated sodium sulphate solution where heat is to be used as precipitant. In the ferrocyanide method he uses both the chemical and heat. The sputum is first mixed with 0.7 per cent sodium chloride solution, the mucin then precipitated with acetic acid, the liquid heated to boiling and a drop or two of saturated ferrocyanide solution added. A slight turbidity, devoid of significance, nearly always results; the test is considered positive where a marked precipitate forms and persists on boiling, the latter dissolving the albumoses that may have been precipitated by the ferrocyanide. In tests made in 404 patients, the reaction was never negative in cases with tubercle bacilli in the sputum. A repeatedly negative reaction therefore excludes tubercle bacillus excretion; where many cases are to be rapidly sorted out, the test permits of rapid separation of the uninfected from the infected. Coupled with X-ray examination, it also permits of discounting the significance of any suspicious rough breathing at the apex or exacerbation of apical pleuritis. The test is constantly positive in chronic lung tuberculosis, but is also often positive in nontuberculous acute inflammations of the lungs and in pulmonary congestion due to heart or kidney disease. It is not infrequently strongly positive in tuberculous cases in which the bacilli are difficult to find, and is very useful for the recognition of apical pleuritis, always agreeing in its results with those of the X-ray examination in such cases. In apical fibrosis, a negative reaction signifies that the lesions are healed, while a positive reaction means that the patient should be kept under observation.

In chronic bronchitis. the test is generally negative, and if persistently positive, careful examination for a tuberculous focus in some portion of the body should be made.—*La valeur d'albumino-réaction des crachets pour le dépistage des tuberculeux, M. Salomon, Presse Méd., September 18, 1919, No. 52, 523.*

**Neutrophilic Index in Diagnosis of Tuberculosis.**—Polymorphonuclear neutrophile leucocytes with two or more separate lobules, absolutely apart and not connected by an isthmus band, are more "matured" and are endowed with a better phagocytic and a greater antibody action than the polymorphonuclear neutrophile leucocytes with one lobule. In cases of tuberculosis where tuberculin is administered, Durel recalls there is always an increase of polymorphonuclear neutrophile leucocytes with one lobule after the injection of a "tonic" dose of tuberculin. This is generally followed in a few days by a corresponding increase of polymorphonuclear neutrophile leucocytes with two or more distinct and separate lobules. Cases where tuberculin reactions are frequently repeated always show a persistently high neutrophilic index, i.e., a high percentage of polymorphonuclear neutrophile leucocytes with one solid lobule. These cases also always show an increase of moisture over the tuberculous lesions. This increase of moisture is accounted for by the overcrowding of polymorphonuclear neutrophile leucocytes about the tuberculous foci, the pressure of the cells against each other producing a pneumonic serum exudate. The predominance of one lobule polymorphonuclear neutrophile leucocytes, associated with an increase of moisture (moist râles) over the tuberculous lesions, and following a reaction to tuberculin or severe exertion, clears up a doubtful condition often seen, but for which no tangible reason could be given nor accountable cause assigned.—*Neutrophilic Index and Administration of Tuberculin, W. J. Durel, South. M. J., September 1919, xxii, No. 9,* 517.

**Complement Fixation.**—A study of complement fixation in 466 cases, including 220 of proved or suspected pulmonary tuberculosis, is reported by Pritchard and Roderick. The clinical chest study by Pritchard consisted of a careful history, a physical and fluoroscopic examination with an interpretation of stereoscopic plates of the chest, three sputum tests and three days' pulse and temperature observation. The serologic study by Roderick consisted of a Wassermann test with both cholesterin and acetone antigens, and a complement fixation test with two antigens for tuberculosis. The work was done separately and charted before the roentgenographic interpretations were made and the laboratory tests were made without knowledge of the clinical study. The complement fixation was made in terms of +, ++, +++, and ++++, and all cases below +++ were considered negative. In attempting the study, the authors were hoping to find a new link in the chain of evidence of the existence of clinical tuberculosis, but no such reliable test as the Wassermann for syphilis was found, but it was still deemed that its usefulness as a routine test was shown. If the authors' observations have been reasonably accurate, and 69 per cent of active moderately advanced cases give a reaction compared with 16 per cent reacting in nonproved cases, they feel that the test is of value, but should not be relied on without additional evidence. A frank reaction calls for careful study of the case. They found no evidence of cross fixation with the Wassermann reaction. Recognizing the great prevalence of nontuberculous pulmonary pathologic conditions, they sought to ascertain the cause of the indisposition, rather than to prove its tuberculous nature. In some clearly advanced cases, no reaction occurred, which may be possibly explained by the cells having become exhausted by prolonged saturation with specific toxin. The Wassermann test should be made in all cases of suspected tuberculosis as the two diseases may be coincident. It is of greatest help in differential diagnosis and stimulates careful clinical observation.—*Complement Fixation Test for Tuberculosis, J. S. Pritchard and C. E. Roderick, J. Am. M. Ass., December 20, 1919, lxxiii, No. 25, 1879.*

**The Polymorphism of Tuberculosis.**—The disease in adults is the flaring up of infection acquired in childhood or reinfection after partial immunization. This flaring up or reinfection is announced by a set of disturbances and symptoms which are usually called "pretuberculosis" but which had better be called the "prerelapse of tuberculosis." It is wrong to say that tuberculosis is the most curable of diseases; the cure of tuberculosis is exceptional. But a first attack confers a relative immunity. To maintain this immunity the resisting powers must be kept at a high level. Tuberculosis cannot progress—in the adult at least—if the soil is unfavorable. Prophylaxis must combat weakening of the race and of the individual. Treatment must combat the bacillus (serotherapy), and tone up the organism until the soil becomes unfavorable (rest, fresh air, nourishing food and medica-

tion to restore minerals and especially calcium).—*Conditions pathogéniques et étiologiques du polymorphisme anatomo-clinique de la tuberculose humaine, E. Sergent, Bull. Méd., October 15, 1919, xxxiii, No. 44, 579.*

**Conjugal Tuberculosis.**—There is considerable difference of opinion in regard to the frequency of conjugal tuberculosis. Probably the most authoritative opinion is that conjugal infection is rare, and any increased incidence is attributed to predisposition and causes other than direct infection. The author as tuberculosis officer of South Devon has visited the homes of reported cases of tuberculosis and examined the patient and the contacts in the home. Out of 156 cases in which husband or wife was examined 91 (58 per cent) were found to be tuberculous, 16 (10 per cent) suspect, 49 (32 per cent) negative. Considering wives whose husbands were first reported, out of 120 cases, 66 (55 per cent) were tuberculous, 12 (10 per cent) suspect and 42 (35 per cent) negative. Among husbands of tuberculous wives, in 36 cases, 25 (69 per cent) are tuberculous, 4 (11 per cent) suspect, and 7 (20 per cent) negative. During the five year period in which the figures were collected, the tuberculous mate first reported has died in 15 cases, and in 7 cases both husband and wife have died. Comparing the results with contacts other than husband and wife, out of 1057 examined, 219 (20 per cent) were tuberculous, 284 (27 per cent) suspect, and 566 (53 per cent) negative. Considering the contacts of cases examined and found nontuberculous, out of 81 examined, 4 contacts (5 per cent) were tuberculous, 7 (8 per cent) suspect, and 70 (87 per cent) negative. A statistical study of this kind is open to many criticisms. However the figures have all been collected by one observer, and hence may be justly compared; they were collected in the course of everyday work and not for the purpose of proving or disproving any theory. After following up these cases, the author is convinced that the great majority of the mates of tuberlous husbands or wives do sooner or later show signs of tuberculosis, but also that the great majority of those infected recover, and recover more rapidly than ordinary tuberculous patients. This may be attributed to an enhanced immunity conferred by graduated doses of bacilli. Over 50 per cent of all cases of tuberculosis are due to direct personal infection, and for that reason highly infective cases should be isolated.—*Conjugal Tuberculosis, E. Ward, Lancet, October 4, 1919, No. 5814, 606.*

**Postinfluenzal Tuberculosis.**—Postinfluenzal tuberculosis is defined as a reactivation of an old tuberculous focus, following a more or less severe attack of influenza. A study of the mortality statistics during and following earlier epidemics and the epidemic of 1918–19 shows that epidemics of influenza are not followed by any measurable increase in the incidence of tuberculosis. To some extent the many pulmonary conditions resulting from the recent epidemic of influenza obscure the early diagnosis of tuberculosis. From a study of the statistics of influenza in several tuberculosis sanatoria, the conclusion is reached that in people with a mild or arrested tuberculosis a higher incidence of influenza is evident than in those of advanced type; in people with active tuberculosis a certain degree of immunity is produced by the constant presence of a low grade chronic inflammatory process of the respiratory tract, which protects them to some extent against a frank invasion of influenza. Cases of glandular tuberculosis, especially the cervical and tracheo-bronchial type of children, show a very high incidence of influenza, but very few frank cases of pulmonary tuberculosis follow. Individuals in the prime of life, apparently free from physical defects and previous history of illness are more susceptible to influenza.—*Postinfluenzal Tuberculosis, T. J. Murphy, Boston M. & S. J., August 28, 1919, clxxxi, No. 9, 267.*

**Tuberculosis of the Skull.**—Recent publications show that perforating tuberculous lesions of the skull are not so rare as generally assumed; 13 cases have been published by five French writers since Pelletier's compilation of 206 cases in 1910. About 75 per cent of the cases develop before the age of 20, and there are almost invariably other tuberculous lesions elsewhere. The lesion causes few symptoms, merely a dull ache roused by pressure and not worse at night. In the case illustrated, the opening in the frontal bone was a necropsy surprise. If the condition otherwise permits, extensive resection into sound tissue is the most certain means to ward off recurrence.—*La tuberculose perforante de la voûte crânienne, H. Roger, Presse Méd., August 28, 1919, xxvii, No. 48, 481.*

**Tuberculosis of the Jaw.**—A boy of eight developed a tuberculous process in one ankle, a year later one in the forearm, and later one in the tibia. Five years after the first symptoms, an abscess appeared in the left lower jaw and pus kept

reforming after repeated punctures. The entire left jaw shows notable thickening on radioscopy, with a zone of less opaque bone in the horizontal ramus. The prognosis of such lesions is grave. In Perrot's compilation of twenty-four cases, only ten of the patients recovered, and this recovery is precarious. In two cases the patients succumbed to tuberculous meningitis. The outlook in the present case seems absolutely bad.—*La tuberculose du maxillaire inférieur, A. Aimes and Aubanel, Progr. Méd., July 26, 1919, No. 30,* 293.

**Tuberculosis of Conjunctiva.**—One case in a boy of thirteen is reported. At the first examination (September, 1918), the conjunctival trouble had been present all summer. There was a large tumor mass high up under the lid of the right eye; two small reddish elevations on the bulbar conjunctiva near the caruncle extending toward the limbus, a third in the lower cul de sac; enlargement of the parotid gland, of another gland located just below and over the malar process; enlarged tonsils and adenoids. While the patient was under the anesthetic for the tonsil and adenoid operation, the lid was everted, and large masses of granulation tissue found, a majority of the granules being surrounded by a small yellow spot suggestive of tubercle. Slightly to the nasal side of the center there was a deep ulcer; when the exposed surface was scrubbed with gauze, there remained tough ridges of a lineal ulcer extending horizontally over the entire lid. The edges were trimmed with scissors and cauterized with nitrate of silver. Smears taken showed the presence of tubercle bacilli. The best local treatment was found to be cauterization with trichloracetic acid done once a week. From November, 1918, to February 15, 1919, tuberculin O. T. was given beginning with a dose of 0.0001 mgm. once a week, increased later to 0.0002 mgm. The patient was taken from school for three weeks, kept out of doors and not allowed to become fatigued. This regimen with the local treatment caused much improvement. The invasion of the lower lid disappeared, the upper lid is pale from scar tissue, but smooth, the eye free from irritation and conjunctival discharge.—*Tubercle of the Conjunctiva, J. A. Patterson, Am. J. Ophth., September, 1919, ser. 3, ii, No. 9, 679.*

**Tuberculosis of the Retina.** Not many cases of tuberculosis of the retina will be seen by any one observer. The authors report three new cases, and comment on two others from their earlier reports. The first case was observed for two and a half years, coming under observation in the early stages of retinal lesions on account of photophobia due to corneal involvement. The disease in the right eye progressed through the various stages, but in the left eye was controlled and apparently cured with the use of small doses of tuberculin. In case 2 only the left eye was affected, and this was cured and continued normal. In case 3 both eyes were affected and neither cleared up entirely. Of the two earlier cases, one remained in good health with no change in the retinal condition reported in 1914; the other had repeated vitreous hemorrhages and failing vision. From a study of these cases the authors conclude that retinal tuberculosis begins by the appearance of white infiltrates in front of certain retinal vessels, most frequently the veins; later these vessels show all the signs of perivasculitis, and the veins are altered in caliber. At this stage hemorrhages occur; these may be comparatively small and confined to the retina, clearing up at the end with good restoration of vision; or they may be extensive, pushing off or bursting into the vitreous and causing retinitis proliferans with great impairment of vision. In many cases in which the eyegrounds are visible throughout, white dots are formed in the macula, causing impairment of vision, but later clearing up entirely. Often both eyes are affected at first, but one may be only slightly involved and recover completely, while the other is permanently damaged. The course of retinal tuberculosis is protracted. All cases need the general regimen and treatment for tuberculosis; those without extensive tuberculous lesions elsewhere and without pyrexia, do well on small doses of tuberculin at intervals of at least a week.—*Tuberculosis of the Retina, E. Jackson & W. C. Finnoff, Am. J. Ophth., October, 1919, 2, No. 10,715.*

**Prognosis with Complicating Laryngeal Tuberculosis.**—Every case of actual or suspected pulmonary tuberculosis should be examined by a skilled laryngologist, not only once, but repeatedly, for the presence or absence of laryngeal lesions has an important bearing on the prognosis. The author has examined the larynx in 1750 patients admitted to the Midhurst Sanatorium but tabulates the results for only 883 cases examined in the years 1911 to 1915, for whom complete after-histories are available. The cases are classified in three groups, as follows: group I, the disease limited to a small area of one or both apices; group II, cases more extensive but affecting at most the whole of one lobe or severe disease affecting one-half of one lobe; group III, all cases of greater severity than group II, including

those with considerable cavities. In the non-laryngeal cases, the percentage of deaths is lowest in group I, more than doubled in group II, and 70 per cent in group III. The total mortality for all three groups is 39.7 in seven years. In the laryngeal cases the mortality rate for group I rises from 15.6 to 42.9 per cent; for group II from 38 to 63.3 per cent; while the increase in group III is not so striking,—from 70.4 to 78.3 per cent. Taking all three groups together the presence of tuberculosis of the larynx raises the percentage of deaths in the 3 to 7 year period from 39.7 to 68.9 per cent. The tables indicate that of all fairly early cases of pulmonary tuberculosis admitted to a sanatorium, the expectation is that 60 per cent will be alive at the end of that period; but with similar patients with the larynx diseased, only 30 per cent will be alive. If the pulmonary condition of a patient warrants his being classified in group I, the discovery of a laryngeal lesion would grade him down to group II; while if the pulmonary condition would place him in group II, the involvement of the larynx lowers the prognosis to nearly that of group III.—*Prognostic Importance of Tuberculosis of the Larynx, St. C. Thomson, Lancet, October 18, 1919, No. 5016, 689*

**Pneumohydrothorax.**—Ninety per cent of all cases of this condition are due to advanced pulmonary tuberculosis. Two cases are reported and the conclusion is reached that pneumohydrothorax is rarer than formerly; that the prognosis is exceedingly bad; that like the complications of other diseases it is not recognized because not borne in mind and hence not looked for; and, finally, that little or nothing can be done for its correction or alleviation at present.—*Pneumohydrothorax, J. I. Johnston, Am. J. M. Sc., July 1919, clxviii, No. 1, 105.*

**Mitral Stenosis and Pulmonary Tuberculosis.**—Montenegro corrects his statement made in several of his previous articles to the effect that tuberculosis and mitral stenosis could not coexist. He states that it does occur, but very rarely, and reports that out of 20,000 cases of pulmonary tuberculosis one was found with mitral stenosis (a proportion of 0.005 per cent) and that out of 300 cases of mitral stenosis one was found with pulmonary tuberculosis (0.3 per cent). Mitral stenosis inhibits, retards or attenuates the progress of pulmonary tuberculosis.—*Estreches Mitral y Tuberculosis Pulmonar, J. V. Montenegro, Arch. Espan. d. Tisiologia, January 1919, i, No.* 1, 89.

**Pulmonary Tuberculosis and Irritable Heart.**—There is a superficial resemblance between the symptoms of "irritable heart of soldiers" and those of active pulmonary tuberculosis. Ready fatigue, breathlessness, tendency to excessive sweating, tachycardia, and symptoms of asthenia are common to the two conditions. Pain in the left chest, however, which is one of the commonest symptoms of irritable heart, is not characteristic of pulmonary tuberculosis. In the careful study of the history of men with irritable heart, a background of neurotic symptoms, neurologic disease, mental inferiority, emotional instability or psychic maladjustments is almost invariably discovered. Such conditions are, of course, not characteristic of pulmonary tuberculosis. The General Hospital No. 9, Lakewood, N. J., has made the following observations: (1) In a group of 246 men with "irritable heart of soldiers" studied at this hospital, one was found with definite signs of arrested pulmonary tuberculosis. Two men of this group developed active pulmonary tuberculosis after influenza. No other diagnosis of pulmonary tuberculosis was made. (2) Intensive study of 32 cases of irritable heart showed arrested pulmonary tuberculosis in only one case, with no instance of active tuberculosis. No evidence has been found, from the study of irritable heart at this hospital, that there exists more than an accidental relationship between this condition and pulmonary tuberculosis.—*A Study of the Incidence of Pulmonary Tuberculosis in Soldiers with Irritable Heart, J. T. King, Jr., Arch. Int. Med., August 15, 1919, xxiv, No. 2, 238.*

**Physical Basis of Gastrointestinal Symptoms in Pulmonary Tuberculosis.**—The embryological origin of the respiratory system from a diverticulum of the gastrointestinal canal, gives to the lung the same double innervation as that of the intestinal tract. All smooth musculature and all secreting glands of the lungs and bronchi, like those of the stomach and intestines (except the sphincters) are activated by the vagus nerve and inhibited by the sympathetic. When the lung is inflamed, the sensory fibres of the pulmonary branches of the vagus are irritated, and this produces a reflex stimulation of the motor neurons of the vagus which supply the gastrointestinal canal. The common gastrointestinal symptoms typical of preponderating vagus stimulation are nausea, vomiting, hyperchlorhydria, gastric supermotility, colicky pains, spastic conditions of the intestines, notably

spastic constipation, colitis, diarrhea, and intestinal stasis. And it is this group of functional disturbances that is found most frequently in patients suffering from early active or chronic semi-quiescent tuberculosis. During the stage of toxemia the cells of the entire nervous system are irritated by the toxins, which act primarily upon the sympathetic nerves and in this manner cause a general inhibition of action through the gastrointestinal tract, submotility, hypochlorhydria, and constipation due to lessened secretion and lessened peristaltic action. In studying the gastrointestinal symptoms in pulmonary tuberculosis, it is necessary to distinguish between the active form of the disease with marked toxemia and the type in which toxemia is not prominent. It is also necessary to know the nervous, physical and psychical condition of the patient before the pulmonary tuberculosis developed, and to know whether he previously suffered from any particular type of digestive disturbance. For the patient's nervous condition will determine to a great extent whether the reflex stimulation is sufficient to overcome the action of opposing nerves and produce the characteristic symptoms. Other factors also have a part in the causation of the gastrointestinal symptoms in pulmonary tuberculosis, but a thorough knowledge of the visceral nerves and their relationships will place these symptoms on an understandable basis.—*Physiologic Basis of the Common Gastrointestinal Syndromes in Pulmonary Tuberculosis, F. M. Pottenger, Boston M. & S. J., October 23, 1919, clxxxi, No. 17, 501.*

**Intestinal Occlusion in Tuberculous Peritonitis.**—Intestinal occlusion rarely occurs during tuberculous peritonitis, regardless of the varied and numerous lesions created by the process. Occlusion is twice as frequent in the female in both the acute and chronic types of this disease and is encountered at any age. Acute occlusion is most frequently the result of intestinal paralysis, a band, an intestinal kink, and much more rarely invagination, volvulus or torsion of the mesentery. Chronic occlusion is produced by agglutination of the intestinal coils, multiple bands, or fibrocaseous masses. The ascitic form of tuberculous peritonitis does not give rise to occlusion. The acute miliary form provokes occlusion by the mechanism of intestinal paralysis. Other causes of occlusion result from chronic peritonitis. Paralysis may intervene in occlusions produced by a real obstacle and superimpose its action to that of a band or kink. Generally speaking, the lesions are much more extensive in chronic occlusion than in the acute forms.

An occlusion may arise during a tuberculous peritonitis which has been recognized, but it is often encountered as an initial accident of a latent tuberculosis of the peritoneum. In these circumstances the diagnosis of the tuberculous nature of the lesions which provoke the occlusion is difficult, if not impossible, to make. Given an acute occlusion, one should always think of tuberculosis and look for tuberculous localizations which may indicate the way to the diagnosis. It is to be remembered that an acute occlusion from tuberculous peritonitis may closely simulate appendicitis or acute peritonitis. The fecal vomiting is not constant and not necessary for diagnostic purposes. Complete stercoral arrest, and a thermic drop are sufficient evidences of occlusion.

When diagnosis is doubtful, abdominal incision should be resorted to if only to discover the nature of the morbid process and site of the lesions, while at the same time it is the best form of treatment. Medical treatment may be essayed in acute occlusion, and if too much time is not wasted in the use of electric enemata these should be tried, at least at the onset of the symptoms and especially in circumstances where an immediate operation is an impossibility. Abdominal incision is the treatment of choice in acute occlusion and the one which offers the greatest benefits to the patient, but it must be carried out as rapidly as is consistent with good surgery. Exploratory laparotomy has given unquestionably good results when the occlusion has been due to paralysis of the gut. Enterotomy should be employed preferably in circumstances where a proper technic cannot be carried out or where the patient's condition demands rapid work. In chronic occlusion, where the lesions are usually extensive, operation is not to be rejected for this reason, because after exploring the abdominal cavity an artificial anus or an enteroanastomosis can be done according to the demands of the case. A considerable retrogression of the lesions and pseudotumors—occasionally their complete disappearance—is frequently observed after abdominal incision.

The prognosis of intestinal occlusion in tuberculous peritonitis is serious and the operative mortality is greater in the acute than in the chronic forms, being 24 per cent in the former and 18 per cent in the latter. The mortality from generalization of the tuberculosis is 14 per cent in acute occlusion and 32 per cent in the chronic forms. Recovery is 61 per cent in the acute types, as against 50 per cent in chronic occlusion.—*Editorial Note, N. York M. J., December 13, 1919, cx, No. 24, 1993.*

**Difficulties in Diagnosis and Treatment of Unilateral Renal Tuberculosis.**—In the great majority of cases of tuberculosis of the genito-urinary system in the male, the primary focus is found either in the kidney or in the globus major of the epididymis; from these foci the infection spreads to the excretory ducts of the organs primarily involved, and to structures lying on the course of and in connection with these ducts. The major symptomatology of urogenital tuberculosis depends upon these extension processes rather than on the existence of the primary foci. In the great majority of cases in males the disease is not diagnosed while limited to the kidney, but the first cystoscopic examination shows an involvement of the bladder wall nearest the ureteral orifice. If there is a more extensive involvement of the bladder, the prognosis is grave. Surgeons agree that unilateral renal tuberculosis should be treated by nephrectomy, but the disposal of the diseased ureter is not governed by any such general rule. Indications for the total removal of the ureter are: (1) ureter strictured below, dilated above and secondarily infected; (2) ureter dilated, infected and in free communication with the bladder; (3) ureter enlarged, soft and diffusely involved in a subacute miliary tuberculous process. In other cases the ureter should not be disturbed, or only such part removed as can be reached through the ordinary nephrectomy wound. Unilateral renal tuberculosis may be overlooked in the presence of a complicating genital infection or in the presence of a more obvious nontuberculous lesion in the opposite kidney. Two illustrative cases are reported. Primary tuberculosis of the bladder is undoubtedly possible, but is a very rare condition. In some cases a primary renal lesion is so limited, and gives rise to so few symptoms, that the more obvious bladder tuberculosis appears to be primary. A case is reported in which the indigo-carmine test showed faulty function of the left kidney, but no tuberculous focus was found by an exploratory incision.—*Unilateral Renal Tuberculosis, L. Herman, Ann. Surg., August, 1919, lxx, No. 2, 203.*

**Ascending Renal Tuberculosis.**—That ascending renal tuberculosis, though not common, can occur is proved by two cases which came to operation. It cannot be ascertained that the secondary involvement of the kidney occurred in the true ascending fashion, by continuity of surface, for it might well have taken place through embolic processes. It is notable that nephrectomy benefited both of these patients in spite of the fact that the kidney lesions were minimal compared to the changes in the bladder and lower ureter. This is explained by the fact that removal of the organ put an end to the more or less constant reflux and stagnation of tubercle-laden urine in the lower ureter, giving the bladder a chance to take care of itself. The distinction between ascending renal tuberculosis and the usual descending form cannot be made out by clinical methods it seems, for in both cases bacilli are found in the urine coming from the pelvis of the kidney. On examining the removed kidney, however, one finds the tuberculous changes to be almost insignificant as compared to those found on cystoscopy of the bladder; the parenchyma may be free from disease or contain only a few miliary tubercles on section. The surface of the organ also appears healthy. The lesions are practically confined to the pelvis and calyces, increasing in extent as we examine the ureter nearer and nearer the vesical orifice. *Concerning Ascending Renal Tuberculosis, L. Buerger, Am. J. M. Sc., October, 1919, clviii, No. 4,* 482.

**Rapidly Fatal Spinal Caries.**—Three cases of spinal caries are reported in soldiers of the British Expeditionary Forces. All of the men appeared robust and in excellent health except that case 3 had suffered with pains in the back for several years. The chief symptoms were pains in the back, paralysis of the legs, loss of sensation especially in the legs, but extending upwards as the disease progressed. The illness lasted six days in case 1, fifteen days in case 2, and nine days in case 3. The onset in each case was sudden and without warning. In case 2 some impairment of resonance was found over the base of the left lung, and small crepitations over both lower lobes. Autopsy showed a tuberculous cavity and a few small superficial caseous nodules in the left lung and adhesions on both sides. A large tuberculous gland was found in the mesentery. In the other two cases no pulmonary signs were found during life. Autopsy in case 1 showed both lungs bound down at the base to the diaphragm by old adhesions; more recent adhesions of the left lung to the pericardium and to the chest wall; miliary tubercles in both lungs. In case 3 a diffuse miliary tuberculosis was found in the lower lobe of the left lung, and old calcareous foci in the upper lobes of both lungs.—*Rapidly Fatal Spinal Caries, J. R. Collins, Brit. M. J., August 30, 1919, No. 3061, 265.*

**Tuberculomata of the Spinal Cord.**—The tubercle, the most frequent variety of intramedullary tumors, is most commonly

met with in males from twenty to forty years of age. The morbid process is more prone to occur in the dorsolumbar segment of the cord, preferably in the gray matter. Contrary to the classical descriptions which give a clinical picture of tubercles of the cord in general, it is necessary to divide these lesions into three distinct types, the first of which is tuberculoma of the dorsal region, which at the outset produces a typical Brown-Séquard syndrome in some cases and ends in a spasmodic paraplegia with a more or less complete anesthesia. Secondly, the tuberculoma of the lumbar cord, beginning with painful and atrophic phenomena in one leg, thus simulating a serious form of sciatica and ending in a limp, atrophic paraplegia with anesthesia and paralysis of the sphincters. Thirdly, tuberculoma of the cervical expansion, the début of which is also manifested by painful and atrophic phenomena, but these are limited to the arms, while the tuberculoma, continuing its evolution, gives rise to a homolateral spinal hemiplegia, with or without Brown-Séquard's syndrome and ending in a complete spasmodic paraplegia with anesthesia reaching to the upper part of the trunk. In some cases bulbar phenomena appear. During the evolution of a tuberculoma of the cord the disturbances of sensation offer a radicular topography, whether or not they extend to one-half or the entire body. They have a certain predilection for thermic sensibility. They may also assume sensibility to pain of the syringomyelic type, which can be explained by the localization of the tubercle in the gray matter between the anterior and posterior horns. Although in intramedullary tumors radicular phenomena have been regarded as rare, it would appear that tuberculoma offers an exception in this respect, because certain forms, particularly those of the enlargements of the cord, have a distinctly radicular phase—pain and atrophy. In one case the explanation of the importance of these radicular symptoms was given inasmuch as there was a true infiltration with degeneration of the anterior and posterior roots (Ackerman, *Thèse de Paris*, 1914). Ackerman has, like most other writers, noted the great frequency of unilateral development of the tubercle. Even when it reaches very considerable size one-half of the cord will be found to be pushed aside, but it is normal. This is in accord with the clinical evolution, because the symptoms are unilateral and also on account of the possibility of a predominance of disturbances on one side until the end of the affection. Although meningeal lesions are common they are, in these cases, usually secondary to the process in the cord. In one case they consisted of a true pachymeningitis, while in another instance of tuberculoma of the cord there was a tuberculous lesion of the spine, although there was no immediate relationship between the two processes, the bone lesion being seated in the first lumbar vertebra, the tuberculoma occupying the fourth and fifth dorsal segments. In all cases of tuberculoma of the cord pulmonary or suprarenal tuberculous lesions are present. The tuberculoma offers different histological aspects according to the case. It may be in the form of an agglomeration of follicles or as a compact caseous mass. Giant cells may be found, but Koch's bacillus is apt to be absent in the sections.—*Editorial, Med. Rec., November 1, 1919, xcvi, No. 18, 729.*

**Nervous Irritability and Tuberculosis.**—Attention is called by Ferranini (The Nervous System in the Tuberculous: *Riforma Medica*, February 22, 1919) to the extreme and intense excitability of the nervous system in tuberculous patients. He reports various laboratory measurements which reveal the rapidity and early exhaustion of nervous reaction with the weakened tonic capacity which accompanies it. He attributes this to the action of the toxins upon the nerves, which, with the action upon the endocrine system or the effect of the latter action again upon the nervous excitability, forms a vicious circle. To this must also be added toxic irregularities of growth which affect principally the nervous system, which may be of importance in the growth of the young. Such manifestation of this nervous excitability may be of diagnostic import in the case of older individuals.

From this important viewpoint there is seen to be a possible close association of tuberculosis with the nervous system in its anatomical growth. For the author also describes the injury that may result to the spinal cord and its roots by an exaggerated growth of the brain, through the physiological disturbance which results, or through the toxic action upon the nerves or through the endocrine system. And all this serves to open the way to a still further very important consideration of which the anatomical and physiological facts are a basis. If one considers these as the pathways of energy distribution and as such informed and governed by the putting forth of energy or the withholding of it from output which marks the personality, there appears another most important and nonnegligible point of attack upon this nervous phase of tuberculosis. The extreme irritability is indeed a most important diagnostic sign. It may be also psychically a diagnostic and therapeutic factor of which service should be

made. The most advanced psychic therapy aims at the discovery of energy exhaustion in a badly regulated output or in a restraint of external output for hidden psychic reasons, which interferes with active utilization upon the external world and its interests. In such case the energy is driven to an activity within the physiological or autonomic personality, there to produce serious disturbance, which causes receptivity rather than resistance to infectious agents and their activity. Does not therefore the calling of attention to this significant nervous irritability strongly suggest the necessity of psychotherapeutic inquiry? The initial and warning appearance of such proof of badly used energy should contain significant possibilities, at least in incipient cases of tuberculosis. There should be a promising field here for prophylaxis against the development of such a psychic state and its consequent influence upon the physiological condition. An instance like the following is all too typical of the complete lack of understanding on the part of the patient and of the medical measures which too often foster the destructive energy activity in its secret psychic and physiological strongholds. No means are used to discover it and direct it to a discharge which would relieve the overwrought nerves and other physiological pathways. A patient with a comparatively mild infection, but with a disposition which had timidly, but unconsciously to itself, shrunk from all forms of effort demanding responsibility, most conscientiously took the doctor's advice and undertook to combat the disease by the most rigid abstention from all interests at home or abroad which could demand the slightest effort, kept the letter of the law most scrupulously, but rapidly declined and died. The actual ravages of tuberculosis were insufficient to have caused her death but the entire nervous system had reached a hypersensitivity which had produced an uncontrollable nervousness and a general derangement of all the organs so that the anarchy within the body was such that life could no longer be maintained. All the efforts of the physicians, as well as of the patient, had been toward fostering energy, but all avenues for its safe discharge had been neglected or deliberately cut off. Should not the testimony from the anatomy and physiology of the nervous system drive medicine also to a consideration of the psychotherapeutic duty involved in such cases?—*Editorial, N. York M. J., September 6, 1919, cx, No. 10, 423.*

**Symptoms and Diagnosis of Primary Tuberculosis of the Uterus.**—It is certain that disturbances arising in the genital system of the female may have a particular significance when they occur in subjects having tuberculosis, but in the case of primary tuberculosis of the uterus where the anamnesis offers nothing to arouse suspicion, the difficulty of appreciating their value can be easily conceived. Not many years ago menstrual disturbances were given such importance in this respect that they were regarded as pathognomonic of bacillosis. There may be amenorrhea occasionally, but more frequently unimportant variations in the regularity of the menses are observed. Likewise, the amount or quality of the uterine secretion does not constitute a reliable sign of tuberculosis of the organ, but when after a free flow an elimination of caseous material takes place, the probability of tuberculous lesions should be immediately thought of. Search for the bacillus will often confirm the diagnosis. It has been maintained by some that primary dysmenorrhea—occurring with the first appearance of the menses in contrast with secondary dysmenorrhea, which is almost always the result of some affection of the organs of generation—is frequently the initial symptom of a tuberculous focus in the genital apparatus and consequently is of paramount importance in the diagnosis of tuberculosis of the uterus.

One encounters young girls or young women with metrorrhagias which cannot be explained either by chlorosis or lymphatism. Medical treatment is without avail, while light curettement often has no beneficial result, so that at length the uterine cavity has to be painted with tincture of iodine or a solution of perchloride of iron or chloride of zinc. In a certain number of these patients pulmonary tuberculosis develops later, and for this reason Vincent, of Lyons, had the fungous scrapings removed from the uterus examined bacteriologically. The result was that the fungosities contained characteristic tuberculous elements. The clinical data were consequently confirmed by pathology as to the tuberculous nature of the causative factor of the obstinate metrorrhagias. From his findings Vincent does not pretend that every socalled essential metrorrhagia or menorrhagia is tuberculous, and the cases he has observed are exceptional, as he himself points out, but the conclusion to be drawn is that the clinician is thus warned of the possible danger of tuberculosis. In a large number of cases the genital lesions may remain dormant for many months, but the tuberculosis may become generalized during this time, making the prognosis serious. Sometimes the generalization occurs suddenly, giving rise to a miliary process; at others, the secondary lesions assume the classic chronic types, and finally, in other in-

stances, the tubercle bacillus extends by continuity to the tubes and peritoneum, there setting up inflammatory reactions which later on may serve as the starting point of a general infection.—*Editorial, N. York M. J., December 6, 1919, cx, No. 23, 947.*

**Tuberculosis of the Uterus.** The disease occurs at all ages but is most common between twenty and twenty-nine years, and in the following decade. It occurs in four main types: ulcerative, miliary, interstitial and peritoneal. In the earliest ulcerative type the lesion is microscopic and consists of minute yellowish-white nodules upon the mucosa, which increase in size, coalesce, caseate and finally ulcerate, throwing off necrotic material into the uterine cavity. The least frequent form is the interstitial, which attacks the connective tissue among the muscular elements and finally destroys the muscle bundles. While usually tuberculosis of the uterus is secondary there are well authenticated cases on record of primary involvement where the infection took place through coitus or the use of infected instruments. The symptoms of the condition are not at all typical and are those of any other inflammation of the uterus. They usually consist of menstrual disorders such as menorrhagia, dysmenorrhea, and at times amenorrhea. The most frequent, however, is metrorrhagia accompanied by a feeling of weight in the pelvis which becomes worse at the time of the menstrual period. Definite pain is rather of late appearance, while leucorrhea is not infrequent. The cervix uteri may offer no findings suggestive of the condition, and in those rare cases where it is involved it has the appearance of carcinoma. The uterus may feel boggy and softer than normal, and, at times much enlarged. Although in most of the cases the tubes will be found involved, absence of enlargement of the Fallopian tubes does not exclude tuberculosis of the uterus. The presence of a family history of tuberculosis, particularly of a husband suffering from tuberculous involvement of penis, testicles or epidydimis, is of great value in diagnosis. While sterility is common in this condition pregnancy has been known to take place not infrequently. The most positive method of diagnosis is the examination of the leucorrheal discharge, but the staining method is not always sufficient on account of the frequent presence of other acid-fast bacilli in the discharge. Examination of the curettings or better, grinding them up and making of an emulsion for the inoculation of a guinea pig are the best methods. The prognosis is nearly always gloomy, except where it is possible by an operation to remove the diseased organs fairly completely. There is even a fair degree of success in cases where the uterus alone is involved in mere curettage and cauterization. Drainage should not be employed after operation for the cure of this condition as it predisposes to mixed infection.—*Tuberculosis of the Uterus, J. R. Scott, Calif. State J. M., February, 1919.*

**Tuberculosis of the Anus.**—Primary tuberculosis of the anus or rectum is rare, but secondary lesions in patients with phthisis are quite frequently seen. Anal tuberculosis may be either miliary, ulcerative, lupoid or verrucous. The miliary type is very rare. Tuberculous ulcers at the anus begin insidiously, often following a slight injury. The borders of the ulcers are clear cut with a ring of induration; the base is irregular, gray in color and does not bleed easily; on the surface are small yellow tubercles. There is not much pain with the passage of feces, or on manipulation for examination. The ulcers spread continuously in all directions, slowly in some cases, and rapidly in others. Lupus ulcers are usually multiple with soft insensitive bases and edges covered with granulations; the discharge is profuse but odorless. The first evidence of the presence of the tubercle bacilli is the development of translucent gray nodules; these nodules coalesce and may undergo necrosis, or an abscess may result, probably owing to secondary infection. If healing fails, an ulcer results, its base covered with yellow necrotic material, with tuberculous granulation underneath. Infection of the bowels and the anus in patients with phthisis is caused by swallowing the infected sputum. This should be prevented as much as possible. When infection and ulceration have occurred, medication by mouth is not beneficial. If the patient's condition is fairly good, the anal ulcer may be thoroughly curetted with the Paquelin cautery, and exposed to the sunlight and air for several hours each day, with a light covering of white cloth to prevent painful sunburn. When the patient is too weak for cauterization, exposure to sunlight alone often gives excellent results. For anal lupus, either the Finsen light or the roentgen ray may be used. The use of both is pushed till a blister or burn results, and treatment is repeated when this reaction has subsided.—*Tuberculosis of the Anus, C. J. Drueck, Surg., Gynec. & Obstet., October, 1919, xxix, No. 4, 393.*

**Pulmonary Abscess, Bronchiectasis and Tuberculous Cavity.** In the differential diagnosis of pulmonary abscess, bron-

chiectasis and tuberculous cavity the history will be of greater aid than the physical examination. Pulmonary abscess usually follows acute infection of the lung with any of the pyogenic organisms and is also common after operations on teeth, tonsils and nasal cavities as a result of inhalation. In abscess there is a history of acute onset, periodical rises in temperature, and sometimes bloody, sometimes foul-smelling, expectoration. Clubbing of the fingers comes on earlier and becomes more marked in this condition than in any of the others. Abscess is commonly located in the lower lobes. Bronchiectasis usually follows a pneumonia in childhood, although it may follow this condition in adult life; it may also begin with a bronchitis. The cough is loose, indicating that the secretion is in the larger bronchi where it is easily moved. This is of diagnostic value. Clubbing of the fingers appears slowly and is never as marked as in abscess. Tuberculous cavity formation is more liable to be preceded by repeated attacks of toxemia, sometimes months apart. There is more nervous irritability, more nutritional disturbance and wasting with increased reflexes of the chest muscles. Repeated attacks of bronchitis are common in both tuberculosis and bronchiectasis but not in pulmonary abscess. Tuberculous cavity is most common near the apex, bronchiectatic cavities near the hilum. The scarcity or total absence of râles is characteristic of both bronchiectasis and abscess, while in cavitation they are found in large numbers around the cavity, unless the latter is surrounded by scar tissue.—*Points of Differential Diagnostic Value in Pulmonary Abscess, Bronchiectasis and Pulmonary Tuberculosis, with an Explanation of the Cause of the Difference in Auscultatory Findings, F. M. Pottenger, Am. J. M. Sc., October, 1919, clviii, No. 4, 502.*

**Diagnosis of Bronchiectasis.**—While bronchiectasis will rarely be confused with acute progressive phthisis, it may be difficult of differentiation from that form of tuberculosis characterized by mild constitutional symptoms, little or no wasting, with physical signs suggestive of marked fibrosis. Especially will it be difficult to recognize those cases of bronchiectasis showing an elevation of temperature during the afternoon hours, and hemoptysis. These latter symptoms, however, are by no means pathognomonic of tuberculosis as formerly believed and are common occurrences in bronchiectasis. The history is most important and will reveal in cases of bronchiectasis that there are not and have not been present those symptoms of toxemia characteristic of tuberculosis; and the patient is in fair health in spite of the profuse expectoration and distressing cough. Physical examination shows a unilateral lesion, most frequently involving one of the lower lobes. The differential diagnosis may be more difficult in cases where there is a complicating pleural effusion. The latter need not be considered as pathognomonic of tuberculosis any more than the symptoms mentioned above, since pleural effusion may occur in other conditions, such as carcinoma of the lung, as well as in bronchiectasis. The same criteria will aid the diagnosis in these cases; absence of wasting, unilateral character of the lesion and absence of bacilli in the sputum on repeated examinations. Rarely bronchiectasis is found in one of the upper lobes; in such cases prolonged observation will be necessary. Bronchiectasis is due to a combination of causes within and causes external to the bronchi. Among the former, pertussis, acute and chronic bronchitis, and foreign bodies are best known. An inflammatory process in the wall of the bronchi due to local infection tends to paralyze the underlying muscle tissue. Chronic interstitial pneumonia and thickened pleura of nontuberculous origin are the extra-bronchial causes.—*Bronchiectasis: Its Differentiation from Pulmonary Tuberculosis, B. Stivelman, Am. J. M. Sc., October, 1919, clviii, No. 4, 516.*

**Roundworms and Lung Disease.**—It has long been known that the roundworms of man (*Ascaris lumbricoides*) sometimes occur elsewhere in the body than in the small intestine, their usual habitat. Until the recent investigations of Stewart, however, the fact that the *Ascaris* is regularly parasitic in the lungs during an early stage of its development was not even suspected. Stewart's experiments have been repeated and the facts verified by Yoshida and by Foster and Ransom, and the important discovery made, that the larvae of *Ascaris* after hatching in the intestine of an animal that swallows the eggs migrate to the lungs and then return to the intestine, has been fully confirmed. Foster and Ransom, however, do not reach the same conclusions as Stewart as regards the rats and mice being intermediate hosts. No such intermediate host is necessary. The important points deduced are as follows: Infection occurs as the result of swallowing eggs of the parasite containing fully developed embryos, no intermediate host being necessary. After the young worms hatch in the intestine they do not immediately settle down, but migrate to the liver, lungs and other organs meanwhile undergoing considerable growth and development. Those

that reach the lungs return to the intestines by way of the trachea and esophagus, then settle down and develop to maturity if the host is suitable; otherwise they are soon eliminated in the feces or they may not fully mature in some hosts. Pneumonia commonly occurred in experimentally infected animals about a week or ten days after infection, at a time when the invasion of the lungs by the migrating larvae is at its height. Ransom quotes a rather indefensible experiment by Mosler in 1867 and some observations by Lutz as to the pulmonary symptoms being caused in human individuals by the ingestion of *Ascaris* eggs. With our present knowledge it would seem a matter for careful investigation especially in the case of pulmonary diseases of young children.—*A Newly Recognized Cause of Pulmonary Disease—Ascaris Lumbricoides, B. H. Ransom, J. Am. M. Ass., October 18, 1919, lxxiii, No. 16, 1210.*

**A Scheme of Treatment of Tuberculosis.**—One of the weakest links in the present schemes for handling the tuberculosis problem is the present method of reporting the disease. It conveys no information regarding the type of the disease, the extent to which there exists danger of infection, or the home conditions and circumstances of the patient, and it places no initial responsibility on the medical practitioner with regard to these important points. The first essential unit in the scheme is the dispensary, which must be connected in an intimate relationship with the medical practitioner, the hospital and the sanatorium. Its function is to serve as a center for diagnosis, treatment, observation and dissemination of knowledge with regard to preventive treatment. The success of the dispensary depends in large measure on the extent to which adequate provision is made for the immediate admission of patients to hospitals and sanatoria. The hospital for the treatment and segregation of acute and active cases is in many respects the most important unit of the antituberculosis scheme. Its success depends upon adequate and suitable accommodation, compulsory powers of removal where necessary, its central position, a high and sustained standard of treatment and nursing, and the immediate interchange of patients between the hospital and sanatorium when such is indicated. The third unit, the sanatorium, should possess facilities for the industrial training of patients. The patient is kept in the sanatorium as long as there is any possibility for further improvement, and as long as there is no prospect of immediate return to satisfactory home conditions and to some form of employment suitable to his capacity for work. The following conditions must be fulfilled in order that the sanatorium may yield permanently satisfactory results: A high and uniform standard of treatment, the selection of early and arrestable types of cases, early admission, adequate accommodation, prolonged treatment with training in suitable occupations, an official scheme of after-care, healthy home conditions and an adequate and efficient standard of the allied units of treatment. The absence of adequate and suitable provision for the conservative treatment of surgical or non-pulmonary tuberculosis constitutes one of the weakest links in the present methods of treatment. The results obtained by modern conservative treatment of these cases are excellent both with regard to recovery and the prevention of deformity, and well repay the cost incurred. The successful treatment of these cases requires that large special hospitals be provided in suitable localities. The present system of domiciliary treatment has to be reconstructed. It requires an efficient medical and nursing service and satisfactory home conditions. The cleavage advocated between preventive and curative treatment is neither practicable nor desirable. Open-air schools while indispensable in any scheme, must be supplemented by proper home conditions, sanitary surroundings, pure milk and proper food.—*A Scheme of Treatment of Tuberculosis, H. H. Thomson, J. State Med., October, 1919, xxvii, No. 10, 297.*

**Newer Methods of Treatment.**—Outdoor pure air, plenty of good food and rest are the secrets of cure in tuberculosis. Infants under two years should be especially protected from infection. The best means of preventing reinfection and the development of phthisis in older persons is to abolish poor hygienic living and industrial conditions that reduce the normal resisting power of the body. In treatment of active cases with fever, rapid pulse, anorexia and loss of weight, perfect rest in bed is indicated. As the symptoms subside graduated work or graduated walking exercises can be begun, the effects on pulse and temperature being carefully noted. The patient should be kept continually in pure air, and preferably out of doors and in the country. Home treatment is suitable for some cases where the proper surroundings can be provided and the patient saved from worry; in other cases a change of surroundings and sanatorium treatment are more beneficial. The climatic conditions are not so important as the nature of the surroundings and the routine of treatment. All climates can cure phthisis. Contrain-

dications for high climates are dyspnea, tachycardia, heart weakness and marked nervousness. Cardiac and renal cases can be sent to sea climates, consumptives with bronchitis and emphysema to desert climates. The diet must be individualized; over-feeding should be avoided; the food should be increased so that the patient gains in weight and maintains his normal weight. No special diet is indicated where digestion is normal; patients losing steadily in weight and strength need more and better food. Tuberculin is a help to other therapeutic measures and should be used in selected cases. It is best given in moderately advanced cases not improving under hygienic treatment; it is contraindicated in febrile cases. Small doses, carefully increased, are given to avoid producing reactions. There is no drug that will cure tuberculosis. Certain drugs are indicated for special symptoms; e.g., creosote, creosote carbonate or guiacol carbonate for the cough; atropin or agaricin for the night sweats; arsenic hypophosphites and glycerophosphites as tonics. Artificial pneumothorax is one of the recognized methods of treating pulmonary tuberculosis; the gas injected causes collapse of the diseased lung and puts it at rest. There are dangers in this treatment which may be avoided by careful technique, especially by the use of the manometer. The chief indications for artificial pneumothorax are: (1) acute and progressive phthisis, (2) recurring and severe hemorrhages in unilateral cases, even where the other lung is slightly affected. Contraindications are: (1) miliary tuberculosis, in which both lungs are usually affected; (2) diseases of the heart, blood vessels and kidneys; (3) pleural adhesions. About 5 per cent of cases are suitable. The treatment must be kept up for two to four years, sometimes longer. In properly selected cases, there is great improvement and sometimes cure. The most important point for successful treatment is the early diagnosis of incipient cases. In these cases the open-air and rest treatment may effect a cure. Moderately advanced cases usually have a chance, and many non-febrile cases can do useful work. Arrested cases can return to their former occupation unless it is especially unhealthful. They should live simply and avoid overstrain.—*Newer Methods of Treatment in Pulmonary Tuberculosis, M. Kahn, Long Island M. J., June 1919, xiii, No. 6, 165.*

**Treatment of Early Tuberculosis.**—In dealing with tuberculosis it is important to determine both the extent of the lesion and the personality and resisting power of the patient. Rest—the most important element in the treatment of tuberculosis—means not only physical rest, but also such mental treatment as will induce contentment and hopefulness. In certain instances early cases may be treated at home, where proper surroundings can be provided, and where the patient will be more contented at home than in a sanatarium. The essentials for home treatment are an airy room, preferably on the sunny side, rest in bed, cleanliness and intelligent attendance. In favor of sanatorium treatment are the discipline and training in self-care; there is danger, however, of morbid introspection, self consciousness and "hospitalism" being developed. If this tendency can be avoided, the institutional treatment is undoubtedly superior for the great majority of tuberculous cases. There are some who claim that certain climates, especially high altitudes, are necessary for the cure of tuberculosis, but the author believes that good results can be obtained in any climate, although sections where there is the least rainfall and the fewest variations in temperature are preferable, as giving the best opportunity for life out of doors. Diet is another essential in proper treatment. There is no "inherent virtue" in milk or eggs or cream, but the question is one of providing a nutritious and palatable diet containing more heat units than the patient absolutely requires, in order that the body may build up a reserve. The diet should be varied and suited to the patient's appetite. The gastrointestinal functions must be watched, and precautions taken to prevent digestive disturbances. In addition to rest, fresh air and proper food, there must be some diversion, and absolute cleanliness, especially in the care of the excreta. There is a considerable diversity of opinion as to the value of tuberculin in treatment, as well as in regard to the particular preparation to be used. Possibly the T. R. preparation is more generally employed. The author is of the opinion that tuberculin is of value chiefly in surgical tuberculosis and in those patients who are impressed with its use as a part of general treatment. Autogenous vaccines have been recommended in cases of mixed infection, but experience with their use is limited. The treatment of moderately advanced cases is practically the same as in early cases. More complications are likely to arise, such as bronchitis or laryngitis with persistent cough, hemoptysis and gastric complications. All these symptoms must be treated by appropriate measures as they arise.—*The Treatment of Early Tuberculosis, H. G. Webster, Long Island M. J., June 1919, xiii, No. 6, 182.*

**Colony Treatment and After-Care.**—The entire question of the after-care of the consumptive when discharged from the sanatorium and of the colony plan are still under discussion and there exists much difference of opinion even among those who are giving the question most careful attention. While a job in the country has been recommended by many for tuberculous patients, in actual practice the work and surroundings of ordinary farm life are entirely unsuitable for the consumptive. There is also great difficulty in training the consumptive for any suitable trade at which he could work under favorable conditions, and fit him to compete in the open labor market and earn sufficient wages to support himself and his family. If he attempts to return to his old job, under ordinary competitive conditions, this, too, in the majority of instances, ends in disaster. To meet these conditions, the colony plan has been developed to supply an industrial community where the consumptive may work in a suitable environment and where his mode of life may be carefully regulated. In the model colony, the provisions are such that the family may live with the patient. In considering types of employment suitable for consumptives, it is not necessary to limit them to industries carried on in the open air. Strenuous and prolonged physical labor must be avoided, and modern machinery employed. In a well ventilated workshop, with proper machinery and carefully regulated hours of work, the consumptive may earn a reasonable wage. It is not sufficient, however, to maintain a proper standard of living for himself and his family, for even under favorable circumstances, the consumptive cannot do the full work of a healthy man. Hence industries for consumptives must be to a certain extent subsidized by the State; and this the State can afford to do as a protection against the spread of infection. The Inter-Department Committee as a result of its inquiries, has recommended that the plan of the Papworth Colony should be adopted for development in various centers of the country.—*Further Experiences in Colony Treatment and After-Care, G. S. Woodhead and P. C. Varrier-Jones, Lancet, September 20, 1919, No. 5012, 526.*

**Mortality after Sanatorium Treatment.**—A report issued by the British Medical Research Committee on the after histories of patients from the King Edward Sanatorium shows that all but 3.5 per cent of the patients discharged from that sanatorium up to 1914 have been traced. The study presented in the report, however, is based on the records of seven years, covering 1053 men and 654 women. Comparison of the mortality of these cases with the mortality rates of the English Life Table No. 8, shows that persons admitted to the sanatorium in the incipient state of the disease furnished five to six times as many deaths as would have occurred in an average sample of the population; moderately advanced cases 15 to 20 times as many. A series of detailed tabulations indicate that the smallest excess mortality is among those patients discharged when the disease appeared to be arrested; that the mortality is lighter in those cases in which the chief initial symptom is hemoptysis, than when the onset is more insidious; that disappearance of the tubercle bacilli from the sputum is correlated with a lower rate of after mortality; that a family history of tuberculosis did not appear to affect the prognosis. A special chapter devoted to a comparison between ordinary sanatorium treatment and sanatorium treatment combined with the use of tuberculin reveals no appreciable effect for good or ill exerted by the tuberculin. The total number of observations being less than 2000, the sub-tabulations reach numbers so small, that many of the author's detailed conclusions will need verification; but the main conclusion that the death rate of persons discharged from the sanatorium is a good deal higher than the average death rate is not likely to be questioned. To indicate the real value of sanatorium treatment comparison should be made between sanatorium patients and those from the same social class treated on different lines. No such data are available.—*The Mortality of the Tuberculous after Sanatorium Treatment, Editorial, Brit. M. J., September 27, 1919, No. 3065, 417.*

**Treatment of Dysphagia in Laryngeal Tuberculosis.**—An appeal is made to practitioners in general to relieve their patients with tuberculous laryngitis by blocking the superior laryngeal nerve and thus doing away with the painful dysphagia. In an extensive experience at the Lariboisière Hospital with this class of patient, the relief has been constant. The injection of alcohol to block the superior laryngeal is simple and easy, owing to the superficial course of this nerve. The nerve is located by the cornua of the thyroid and of the hyoid bone, and the injection of a few drops of alcohol along its course blocks it completely, and in some cases definitely. There is a sharp pain at once, especially if cold alcohol is used, but it subsides in a few seconds as the nerve becomes blocked. The edema and infiltration retrogress and the patient can eat without dread of pain. A single bilateral injection

answered the purpose in some cases; others required a new injection in five or ten days, but permanent anesthesia was finally realized after a few injections. Seven was the maximum. With the patient seated in front of him, Halphen pushes with two fingers the larynx toward the right with the left hand, and explores with his thumb the groove between the thyroid and hyoid bone on the right side. Holding the thumb there, he introduces the needle on a line joining the two cornua, first perpendicularly, then parallel to the hyoid bone, 1 cm. toward the median line. The thumb feels the needle making its way under the skin between the two landmarks. Then the needle is lightly pushed in deeper as the plunger is worked. A sharp violent pain shows that the nerve has been reached. The cricothyroid membrane must be left unmolested.—*Du traitement de la dysphagie dans les laryngites tuberculeuses par l'alcoolisation du larynge superieur, E. Halphen, Paris Méd., October 11, 1919, ix, No. 41, 296.*

**Diet in Tuberculosis.**—The time of forced feeding in tuberculosis has passed, but there is still a tendency to overfeeding. At the Westfield State Sanatorium the custom of giving raw eggs between meals was abolished long ago, and for the past year no milk has been served between meals. Other sanatoria have also adopted a no-lunch policy. Experience shows that lunches should be served to adult patients only as a special prescription for an unusual condition. It is necessary that food be of good quality, prepared in an appetizing way, and well served; but it is of the greatest importance that it appeal to the taste of the individual patient, and it is therefore essential to offer a variety at each meal. The Westfield Sanatorium has solved this problem by adopting a cafeteria system, allowing the patients a considerable latitude of choice. The results of this policy are that the patients have gained as much or more than under the old system; there has been a noticeable decrease in digestive disturbances; the patients relish their meals and feel that they are getting sufficient nourishment; there is a considerable saving in food cost.—*Diet in Tuberculosis, R. Morgan, Boston M. & S. J., August 28, 1919, clxxxi, No. 9, 252.*

**Diet in Tuberculosis.**—There is no disease that so taxes the resources of the dietitian as tuberculosis. Many conditions cause loss of appetite which makes proper feeding all the more difficult. All foods should be of the first quality, well cooked, and attractively served. A reasonable variety is essential; the diet should be well balanced with a relatively large increase of protein and a considerable increase of fats. Most authorities agree that a tuberculous patient ought to have from 3000 to 4500 calories daily, but many of the advanced types cannot take care of more than 2000. Under the head of proteins, milk comes first; at least one quart should be taken daily; it may be given mid-morning and afternoon to patients who eat well at mealtime. At times sour milk preparations may be used. Eggs occupy a position second only to milk in nutritive value and ease of assimilation; they can be served in a variety of ways except frying. Meat comes third in the dietary of the tuberculous; for vegetable protein, peas, lentils and beans may be used. The foods yielding the highest percentages of carbohydrates are arrowroot, tapioca, corn and rice, honey, sago, wheat flour, toasted bread; dried peas and lentils; certain fruits. The chief fats are butter, bacon, cheese, and some nuts. Sugar is a valuable addition on account of its high caloric content. The limits of each patient's digestion must be carefully considered; but it seems best to give more attention to the palatability of the food and less to its caloric value. The patient will eat more and digest more easily if the food is relished. A sample menu of the Haverhill Sanatorium for a week is given. This provides for three meals a day. —*Diet in Tuberculosis, I. J. Clarke, Boston M. & S. J., August 28, 1919, clxxxi, No. 9, 249.*

**Open Air Classes.**—Marcus describes the work of the Bureau of Child Hygiene of the New York Department of Health and especially the establishment of open air classes in the public schools. They were organized to provide special opportunities for the physically subnormal children after an experimental open air class had been tried. There are now 110 of these at present located on the roofs of the school buildings, in public parks, etc. Experience has proved that in a large city these classes are best placed in the school building. The roofs require the climbing of too many stairs. The public parks would be an ideal location but for the expense of the buildings required. When the school house is originally constructed little additional cost would be incurred for accommodation of one or more open air classes. The following types of children are admitted: those who have had tuberculosis or been exposed to it; those suffering from malnutrition; children who show little stamina and become tired easily and are unable to carry on their class work; children suffering from nervous diseases except chorea; those sub-

ject to colds, bronchitis, etc., and heart disease cases when recommended by a physician. The important factors in the success of the work are fresh cool air, light food, correction of physical defects retarding growth and proper hygienic living conditions. These are all provided for during the school session. It has been found that no temperature is too low provided the children are properly protected, and the increase in weight occurs during the colder months. Extra feeding is always provided between meals if possible, and frequent short recesses for recreation are given. Rest periods from 1 to 1:10 p.m. are given to classes on the upper floors. Proper hygienic conditions at the homes are a difficulty and require much social service work. A poor teacher or one not physically strong is a great handicap to an open air class, as much of the success of the work depends on her. The results from all the open air class work has been so satisfactory in the way of improving health, habits, etc., that the average children would give the same or better results if put under the same conditions.—*Open Air Classes, L. Marcus, J. Am. M. Ass., October 4, 1919, lxxiii, No. 14, 1057.*

**Heat and Tuberculosis.**—Gauss studied the effects of high temperature during the hot spell of July, 1916, on the patients in Cook County Hospital, Chicago, with special reference to the effect on tuberculosis cases. The normal man is supposed to stand the excessive heat strain. For heat stroke it is not unlikely that heat, pure and simple, is the chief factor. During July, 1916, there were admitted to Cook County Hospital 158 patients suffering from heat stroke and exhaustion. But independent of those admitted as frank heat cases, rises of temperature were observed in other patients, greater than might have been expected in the ordinary course of their diseases. In the tuberculosis ward seven patients had temperatures 2 to 3°F. above that due to the usual course of the disease which corresponded in time with the principal heat wave. Similar observations were made in other diseases, but the tuberculous were taken for special study. Most of them had chronic advanced tuberculosis, and their fever tended to run an even protracted course without marked irregularities. The history of every case in this ward was examined and their temperature records were noted for the hottest five days, and the five days preceding and following. Fifty-six cases were thus observed, and their morning and afternoon temperatures for each day were averaged and plotted. In the five days preceding the heat wave, July 20 to 25, the average afternoon temperature varied between 99.5° to 100°F., in the five days of the heat wave, July 26 to 30, the afternoon temperatures varied from 100.5° to 100.8°F. and in the five days after the heat wave the afternoon temperatures varied between 99.7° and 100°F. The striking fact is that during the heat wave the average afternoon temperature was 100.62°F. as compared to 99.8° and 99.86°F. for similar periods preceding and following it. The increased temperature during the foregoing period was probably caused by the high air temperatures and unfavorable air conditions.—*The Influence of High Air Temperature on Tuberculosis, H. Gauss, J. Am. M. Ass., October 11, 1919, lxxiii, No. 15, 1135.*

**Artificial Pneumothorax.**—The typical indication for artificial pneumothorax is the presence of a process tending to caseate, progressive, ulcerative, unilateral, of recent duration and accompanied by fever, in a middle aged subject. The presence or absence of adhesions of the pleura and their extent must be ascertained. In two out of three cases inflation will prove impossible of accomplishment. In three cases where inflation is successful complete pneumothorax will result only in two cases, the third being only partial. Observation of the manometer will show when the pleural cavity has been penetrated by sharp oscillations synchronous with the respiratory movements; when the oscillations fail to appear it may mean that the needle has become clogged while passing through the parietes or that the needle has not yet reached the cavity or that it has already penetrated the lung. In the latter cases a descent of the column of water in the manometer during a prolonged inspiration will be noticed. The most common accidents are subcutaneous emphysema, which is of little importance; severe pains, which can often be avoided but which may be due to the tearing apart of adhesions in which case caution in increasing the gas pressure is imperative. Very severe cerebral symptoms may appear. They are ascribed by some to gas emboli but appear to be rather of reflex origin. The use of too great pressure of gas while attempting to sever adhesions is often followed by cerebral symptoms such as contractures, palsies, and vasomotor disturbances. This practice is therefore dangerous. Rupture of the pleura with the formation of a pyopneumothorax is one of the more serious complications but fortunately rare. What is more common is a serous effusion, sometimes becoming purulent, which while not very serious per se has a retarding influence on the cure and influences the course of treatment. The results of artificial pneumothorax are a diminu-

tion in the expectoration and cough, disappearance of bacilli, decrease in dyspnea and all the other symptoms such as the anorexia, night-sweats, etc. Autopsies performed on subjects who had undergone prolonged treatment with artificial pneumothorax showed distinctly the formation of connective tissue in the affected parts of the lung. Of course, the procedure being only a local measure, general hygiene and all the measures which go to build up body resistance against the tubercle bacillus in the lungs and other organs must continue to be the principal part of the treatment of tuberculosis.—*Le pneumothorax artificiel en thérapeutique. Sa technique, ses complications, ses résultats cliniques et anatomiques, J. Bertier. Progr. Méd., July 12, 1919, No. 28, 272.*

**Simplified Pneumothorax Method.**—Certain disadvantages adhere to the two-puncture method of inducing therapeutic pneumothorax, such as the possibility of air embolus in a vein and the possibility of introducing unfiltered air through the exposed lumen of the needle. A simpler method consists in using a two-way stopcock between the syringe and needle employed for injecting a local anesthetic. One end of this stopcock fits the point of the syringe and the other end fits the needle. A branch extends from the side of the stopcock to which can be attached a rubber tubing leading to the gas apparatus. The stopcock is also provided with a two-way valve, so that when it is turned one way the needle connects with the syringe for drawing up and injecting the local anesthetic, and when turned the other way it communicates with the side branch leading to the gas apparatus. The advantages are summed up as follows: (1) The operation is rendered much simpler and easier. (2) The amount of trauma to the pleura is greatly minimized, and so pleural shock is less likely to occur. Though the cause of pleural shock is not well known, yet judging from what is known about shock in general, it is reasonable to suppose that pleural shock is less likely to occur when the pleura is punctured with a small needle than when it is pierced with a dull trocar and canula. (3) Subcutaneous emphysema is less frequent. (4) The patients do not dread the operation so much when this method is used, as they consider it of a minor character, and it is well known that the state of mind of the patient is an important factor in the success of the treatment. The apparatus is illustrated.—*A Simplified Method for Inducing Therapeutic Pneumothorax, J. Rosenblatt, J. Am. M. Ass., December 6, 1919, lxxiii, No. 23, 1766.*

**Artificial Pneumothorax.**—In fifteen cases of induced pneumothorax in the last seven years, the immediate effects were excellent, but the ultimate outcome was far from satisfactory. The long rest of the lung did not seem to have improved the general condition on the whole, and the disease finally progressed as in cases in which this collapse therapy had not been applied.—*Ervaringen met den Kunstmatigen Pneumothorax, B. H. Vos, Nederl. Tijdschr. v. Geneesk., September 13, 1919, ii, No. 11, 713.*

**Chemotherapy.**—Having observed in previous experiments that xylol had an effect on tuberculous processes, Volpino instituted a series of experiments to test more accurately the action of the substance. His first experiments in this direction were made on twelve guinea pigs, all of about the same weight, and all inoculated with tuberculous sputum fairly rich in bacilli. Four days after infection, six of the guinea pigs were submitted to periodic injections of xylol, the other six animals being kept as controls. One of the six guinea pigs receiving the injections of xylol died on the twenty-fifth day (probably from intoxication), without presenting any post mortem lesions other than a very small nodule in the peritoneum. The other five animals developed very trifling increase in size of the palpable lymph glands, and, when killed forty-six days after infection, presented much less marked internal lesions than were found in the control animals. Further experiments showed that if the xylol injections were begun in guinea pigs, not too seriously infected, on the eighth to tenth day after infection, it was possible to keep these animals alive until the fortieth day without the manifestation of more than limited signs of infection. Whereas, in control animals, very visible external and very wide-spread internal lesions developed by the fifteenth or eighteenth day after infection. Other hydrocarbons (toluene, cumene, etc.) were similarly tested with somewhat similar results. Curative treatment by the intramuscular injection of xylol and cumene (trimethylbenzene) has also been tried in the human subject with encouraging results. The injections were first made in doses of 0.5 to 1 cc. of the undiluted drug, but this was found to induce local pain and some fever. More frequent doses of the hydrocarbon diluted to 10 per cent with sterilized olive oil could be made without the production of either pain or fever.—*Étude expérimentale sur la thérapie de la tuberculose, G. Volpino, Ann. Inst. Pasteur, March 1919, xxxiii, No. 3, 191.*

**Passive Anaphylaxis for the Recognition of Tuberculous Meat.**—The experimental observations of the author have shown that the muscle plasma of cattle affected with tuberculosis, in an advanced or medium degree, injected once into rabbits, induces a condition of hypersensibility, so that subsequent injection of tuberculin produces passive anaphylaxis of a grave character. This reaction may be regarded as specific, because control rabbits, injected with muscle plasma of healthy cattle, do not react, or present very slight disturbance. The anaphylactic state may be transmitted to other healthy rabbits, but the condition is less intense. In both cases the passive anaphylaxis is accompanied by hyperthermia. The reaction may be of use to meat inspectors who have to determine whether meat is tuberculous in cases where the viscera are not available, and where the lymph glands of the part are not involved.—*L'anafilassi passiva per riconoscimento delle carni tubercololiche, L. Granucci, La Clin. Vet., February 28, 1919, xlii, No. 4, 115.*

**Arsenic in Tuberculosis.**—Arsenic has almost unlimited alterative value and is indicated in tuberculosis and in anemia. The form to be selected is one that is most easily assimilated and least cumulative in its effects. Sodium cacodylate is the salt that best fulfills these conditions; it should be given hypodermically in concentrated, nonvoluminous solution. Dosage is governed by the age and condition of the patient and the frequency of administration; the dose may vary from one grain to two grains or more. It is best given at frequent intervals, at least twice a week. The solution should always be warmed to body temperature. One case of intestinal tuberculosis is reported in a woman aged forty-two, who under treatment with sodium cacodylate, improved so greatly that she could return to work.—*Arsenic in Tuberculosis and Anemia, A. R. Caron, N. York M. J., September 20, 1919, cx, No. 12, 513.*

**Treatment of Pulmonary Tuberculosis with Saccharose.**—The author tried in Amrein's sanatorium Lo Monaco's injections of saccharose in nine patients who had profuse expectoration, and in whom the physical findings appeared to be stationary. The only apparent effect obtained was a reduction in the amount of the expectoration in many of the patients. The degree by which the amount of sputum was reduced varied from 20 to 80 per cent. Care and accurate observations of the patients are needful in this treatment, for it is not borne well by all.—*Zur Behandlung der Lungentuberkulose mit Saccharose, P. v. Schulthess-Rechberg, Corr. Bl. f. Schweiz. Aerzte, April 12, 1919, xlix, No. 15, 484.*

**Heteroserotherapy in Pulmonary Tuberculosis.**—An attack of acute pleurisy in the course of chronic pulmonary tuberculosis with absorption of the effused fluid is not infrequently followed by marked amelioration of symptoms. This improvement has been ascribed by some to the mechanical action of the fluid in compressing and immobilizing the subjacent lung, but this explanation is not regarded as satisfactory. It is more probable that the effusion increases the resistance of the patient by a form of autoserotherapy. The authors in 1917–18 treated 8 cases of chronic pulmonary tuberculosis by a method of heteroserotherapy. Fluid from five cases of pleurisy was used—two cases of primary tuberculous pleurisy with effusion, three cases of acute pleurisy with effusion complicating open pulmonary tuberculosis. The effused fluid was withdrawn from the donors' chests with aseptic precautions into flasks containing a 2 per cent solution of sodium citrate in normal saline, the final proportion of pleural fluid to citrated saline being roughly as 3 to 1. In some instances a rough estimation of the number of lymphocytes per cubic centimeter was made. The fluid was sterilized by adding one-tenth its volume of 5 per cent phenol stirring in slowly and was stored in the cold. It was administered by subcutaneous injection, the initial dose being small, 1 to 2 cc., increased gradually to 10, 15 or even 25 cc. At first injections were given two or three times weekly, later when the larger doses were reached, at weekly intervals. Occasionally a slight transient rise in temperature was noted, but no other reaction. All the cases treated, with the exception of case D, had extensive active disease of the lung; in every instance tubercle bacilli were present in the sputum. In three of the cases the treatment had no apparent effect; in two, where improvement coincided with treatment, there had been signs of improvement before it was commenced. Two cases who were going steadily downhill in spite of other measures, showed rapid and marked improvement; in the remaining case (D), where the patient's general condition was good, troublesome symptoms that had persisted for months disappeared. The authors conclude that heteroserotherapy is worthy of further investigation.—"*Heteroserotherapy" in Pulmonary Tuberculosis, J. J. Perkins, R. A. Young & W. O. Meek, Lancet, September 27, 1919, No. 5013, 556.*

**Tuberculosis Vaccine.**—Vaccine prepared by von Ruck was employed in 41 cases of tuberculosis. Twenty-four were charity cases and 17 private. Of the former, there were 14 apparent recoveries, 7 greatly improved, 2 improved, and 1 failure. Of the private cases, 13 were early cases and all apparently recovered; 4 advanced cases also apparently recovered; the remaining two cases improved. A series of experiments on guinea pigs also showed that the animals can be protected against a mild infection with living tubercle bacilli by the administration of the vaccine, and that the active serum taken from human subjects after treatment, or after prophylactic vaccination with the same vaccine, acquires a higher degree of germicidal action upon living tubercle bacilli than is present in normal or tuberculous persons.—*Specific Treatment of Tuberculosis, G. T. Brown, Therap. Gaz., May 15, 1919.*

**Defensive Ferments in Tuberculin Therapy.**—Dargallo explains all tuberculin reactions as an anaphylactic shock brought about by the union of a preformed defensive ferment with a foreign protein, the tuberculin. The active substance in tuberculin is always one and the same, a protein of the tubercle bacillus, or the endotoxin of the same. This substance in the tuberculin, ejected from the focus, or injected from without, gives rise in the body to the formation of antibodies, thus causing a modified immunity or sensitization. These antibodies, described by Wolff-Eisner as lysins, are the same as the defensive ferments of Turros and the author. These preformed ferments, of cellular origin, will attack and digest the less toxic protein contained in the tuberculin, splitting it into minute and highly toxic molecules (Eber's Tuberculopirine, or the Tuberculolysin of Wolff-Eisner) and thus causing anaphylactic shock. This theory explains the local, focal and general reactions.—*Los Fermentos Defensivos en la Tuberculoterapia, R. Dargallo, Arch. Espan. d. Tisiologia, January 1919, i, No. 1, 79.*

**Culture of the Tetanus Bacillus in the Presence of Tuberculin.**—1. From the results of his experiments, Marino concludes that a culture medium containing 1 mgm. of tuberculin per cubic centimeter never permits the growth of the tetanus bacillus. This suggests a very convenient method of estimation of the amount of tuberculin present in a culture of the tubercle bacillus. Ten cubic centimeters of the filtrate of a tuberculous culture is placed in a test tube and sown with tetanus bacillus. If the tetanus bacillus, under anaerobic conditions, does not grow, it may be concluded that at least 1 mgm. of tuberculin per cubic centimeter is present. In order to estimate the amount of tuberculin more exactly, ten tubes are taken, and in them is placed a quantity of filtrate increasing from 1 to 10 cc., along with ordinary bouillon decreasing in amount from 9 to 1 cc. The tubes are then sown with the bacillus of tetanus, and rendered anaerobic. 2. Following up the above method, Marino discovered that antituberculous serum and normal serum, in general, neutralize tuberculin without any difference, both permitting the growth of the tetanus bacillus at the end of forty-eight hours. Sometimes one may even find that normal serum neutralizes tuberculin better than does antituberculous serum, permitting the growth of the tetanus bacillus at the end of forty-eight hours, while the specific serum may not permit growth until the end of the third or fourth day. 3. Using the same method, Marino found that the human and bovine types of tubercle bacillus permitted the growth of the tetanus bacillus up to the thirtieth to thirty-fifth day, while the equine type of the tubercle bacillus permitted the development of the tetanus bacillus up to the fiftieth day. The amount of tuberculin in cultures of human and bovine bacilli was always greater than in cultures of the equine bacilli of the same age.—(*1*) *De la culture du bacille du tétanos en présence de la tuberculine, F. Marino, Revista Hig. y Sanidad Pecuarias, Madrid, June 1919, ix, No. 6, 349. De la culture du bacille tétanique en présence de la tubérculine. Procédé de dosage de la tuberculine, F. Marino, C. R. Soc. Biol., Paris, July 12, 1919, lxxxii, No. 22, 821.* (*2*) *De la culture du bacille tétanique en présence de la tuberculine. Détermination du pouvoir antitoxique des serums antituberculeux, F. Marino, Ibid, 823.* (*3*) *De la culture du B. tétanique en présence de la tuberculine, F. Marino, Ibid, 831* (*from Vet. Rev., November 1919, iii, No. 4*).

**Outcome with Surgical Tuberculosis.**—The authors report on the present condition of 537 patients given operative treatment at Basel in 1913. The data presented show that tuberculous processes in fingers, toes, wrists, glands, tendons, soft parts and skin can be successfully treated almost anywhere. With tuberculous lesions in ribs, sternum, clavicle, scapula, radius or ulna, urogenital organs, intestines or peritoneum, one is justified in applying treatment in the mountains or the lowlands as most convenient. But treatment in a mountain climate is extremely desirable with tuberculous lesions in the spine, pelvis, humerus, shoulder, femur, tibia or fibula, and in the hip, knee

and ankle joints. The advantages of a mountain climate in this group are evident in the figures, and the necessity for a mountain sanatorium for this group as an annex to other hospitals is urged. For the whole of Switzerland, probably one-fifth of the average 15,000 cases of surgical tuberculosis require altitude treatment in addition to the other measures. The aim should be therefore to provide mountain sanatorium accommodations for these 3000 that require it, with a system of interchanges between sanatoriums and hospitals to give this special group the advantages of altitude. Even those patients already living in the mountains need the care and training of a sanatorium. The course of treatment with surgical tuberculosis usually takes one or more years while the course with pulmonary tuberculosis is generally restricted to a few months. As children form the large contingent of surgical tuberculosis cases the loss of time does not matter so much. The system of sanatoriums should be supplemented with institutions where the convalescent and recovered should be gradually accustomed to resume work and train for future activity under medical supervision. There should be a kind of employment bureau in connection, designed for these more or less handicapped persons.—*Die Statistik der chirurgischen Tuberkulosen in Basel fur das Jahr 1913, F. de Quervain & H. Hunziker, Corr. Bl. f. Schweiz. Aerzte, May 24, 1919, xlix, No. 21, 761.*